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Idaho Operations Office

INTEC Water System Engineering Study

INEEL
Home of Science and Engineering Solutions
Idaho National Engineering and Environmental Laboratory

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ABSTRACT

This Idaho Nuclear Technology and Engineering Center (INTEC) (formerly the Idaho Chemical Processing Plant) Water System Engineering Study was conducted in support of the CERCLA Operable Unit (OU) 3-13, Group 4, Perched Water. This CERCLA study was initiated in an effort to identify possible sources of perched water contribution associated with the operations of INTEC by assessing the water systems and conducting a water system balance. The assessment of the operations was conducted with respect to the infrastructure, metering system design, and system operations. Due to a lack of reliable water system data and a lack of adequate metering, a defensible water balance could not be completed. A follow-up document, including a water balance, will be completed after new instrumentation installation and adequate data collection.

This report provides recommendations for eliminating or minimizing possible contributions of plant-derived water to the perched water bodies beneath INTEC. Recommendations in this report include installation of new metering devices, redesign and/or modification of existing metering systems, installation of new data acquisition technology, and possible changes in operational infrastructure pertaining to monthly reporting, system operations, and operational parameters tracking.

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ACRONYMS

CPP	Chemical Processing Plant (original designation of INTEC)
DOE	Department of Energy
ICPP	Idaho Chemical Processing Plant (CPP renamed, now INTEC)
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
RI/FS	remedial investigation/feasibility study
SRPA	Snake River Plain Aquifer

INTEC Water System Engineering Study

1. INTRODUCTION

Release sites within Waste Area Group (WAG) 3 were grouped according to shared characteristics or common contaminant sources in the *Final Record of Decision Idaho Nuclear Technology and Engineering Center, Operable Unit 3-13* (DOE-ID 1999). The seven groups identified in the Record of Decision include (1) Tank Farm Soils, (2) Soils Under Buildings and Structures, (3) Other Surface Soils, (4) Perched Water, *(5)* Snake River Plain Aquifer (SRPA), (6) Buried Gas Cylinders, and (7) SFE-20 Hot Waste Tank System. Group 4, Perched Water, consists of variably saturated groundwater zones above the regional SRPA. The perched water zones result from local recharge from precipitation infiltration, the Big Lost River, the former Idaho Nuclear Technology and Engineering Center (INTEC) percolation ponds, the sewage treatment ponds, lawn irrigation, and other miscellaneous INTEC water sources. Perched water flow is primarily vertical, although some lateral flow occurs, and ultimately recharges the SRPA. Perched water has been contaminated by leaching and downward transport of contaminants, primarily Sr-90 and tritium, from the overlying surface soils and from two instances in which the INTEC injection well (CPP-23) collapsed and service wastewater was released to the perched zones.

Fluctuations in the levels of "perched" water in the soils beneath INTEC, coupled with the facts that the Big Lost River has not shown flow for over 3 years and the old percolation ponds adjacent to INTEC have been offline for over a year, suggest that water could be reaching perched water bodies by means other than natural. This becomes a concern due to various releases of radioactive and chemical spills at INTEC during its 50 years of operation. The introduction of water to the perched water zones may represent a vehicle for transportation of these contaminants through the perched water and ultimately to the groundwater of the SRPA.

Initially, perched water zones associated with INTEC were logically associated with the operation of the percolation ponds, site operations, and the sewage treatment system ponds. However, a separate water inventory study was conducted in 1993, *ICPP Water Inventory Study Project Summary Report,* to identify possible sources of perched water recharge from plant operations, and several changes were made to systems to limit or eliminate the plant operations as a source of recharge (WINCO 1994). Also, since August 2002 the percolation ponds at the south end of INTEC have been decommissioned and the wastewater has been directed to the new percolation ponds located approximately 2 miles southwest of INTEC. These changes seem to have had less of an effect on the levels of perched water beneath INTEC than was anticipated. Figure 1-1 shows the location of INTEC within the Idaho National Engineering and Environmental Laboratory (INEEL). Figure 1-2 is a depiction of INTEC.

1.1 Purpose and Scope of Study

This study will accomplish two goals: (1) determine if an appreciable quantity of water is leaking or is being discharged from plant water systems that may contribute to perched water recharge. This determination will be accomplished by assessing the water systems and collecting existing data to complete a system water balance; and (2) provide recommendations for the quantification, identification, and minimization or elimination of facility-contributing factors. The following tasks were identified to assist in meeting these goals:

- Review the previous INTEC water balance studies and determine data gaps, previous recommendations, and changes that have occurred in facility infrastructure and practices.

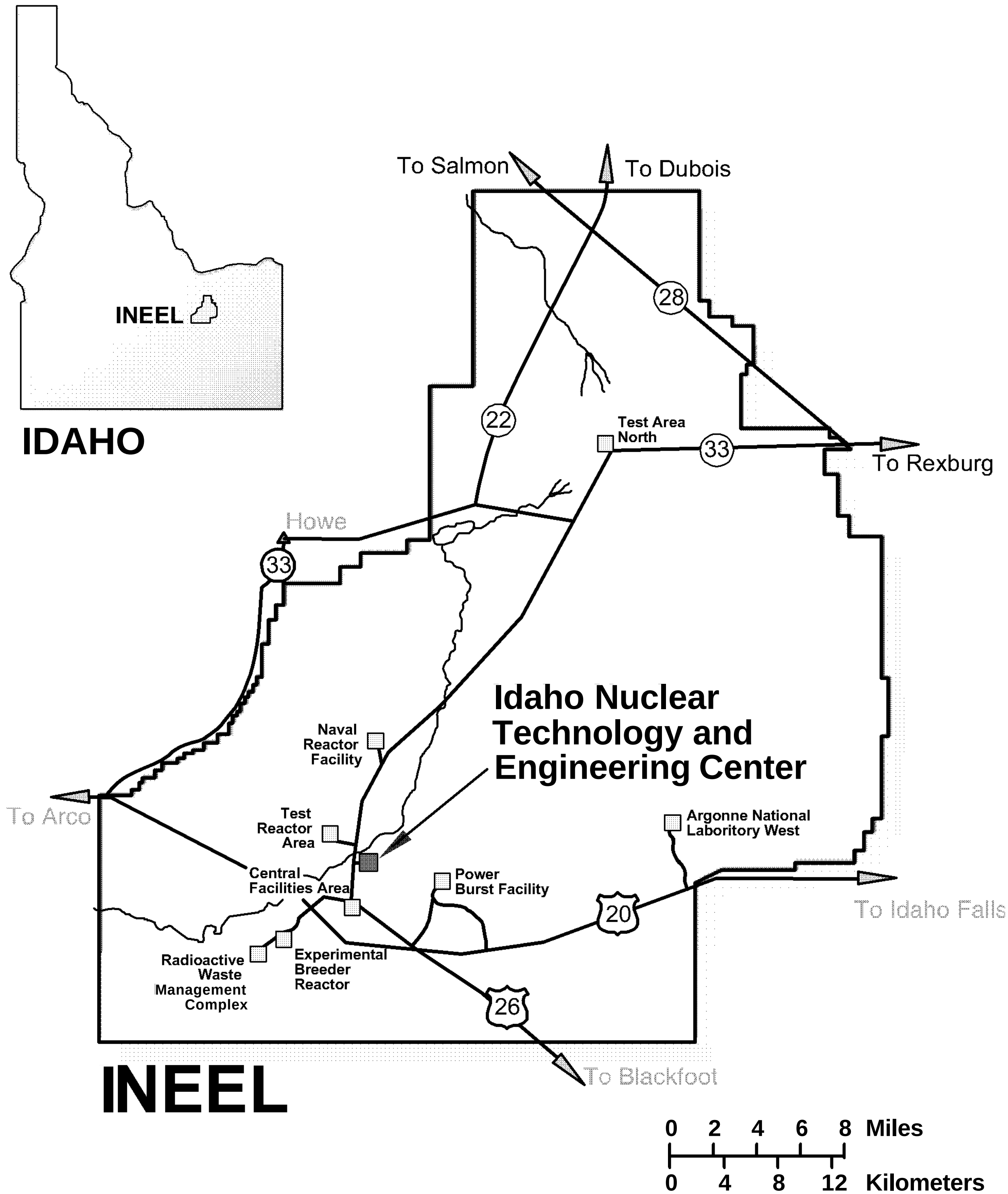


Figure 1-1. Map of the Idaho National Engineering and Environmental Laboratory (INEEL), showing the location of Idaho Nuclear Technology and Engineering Center (INTEC).

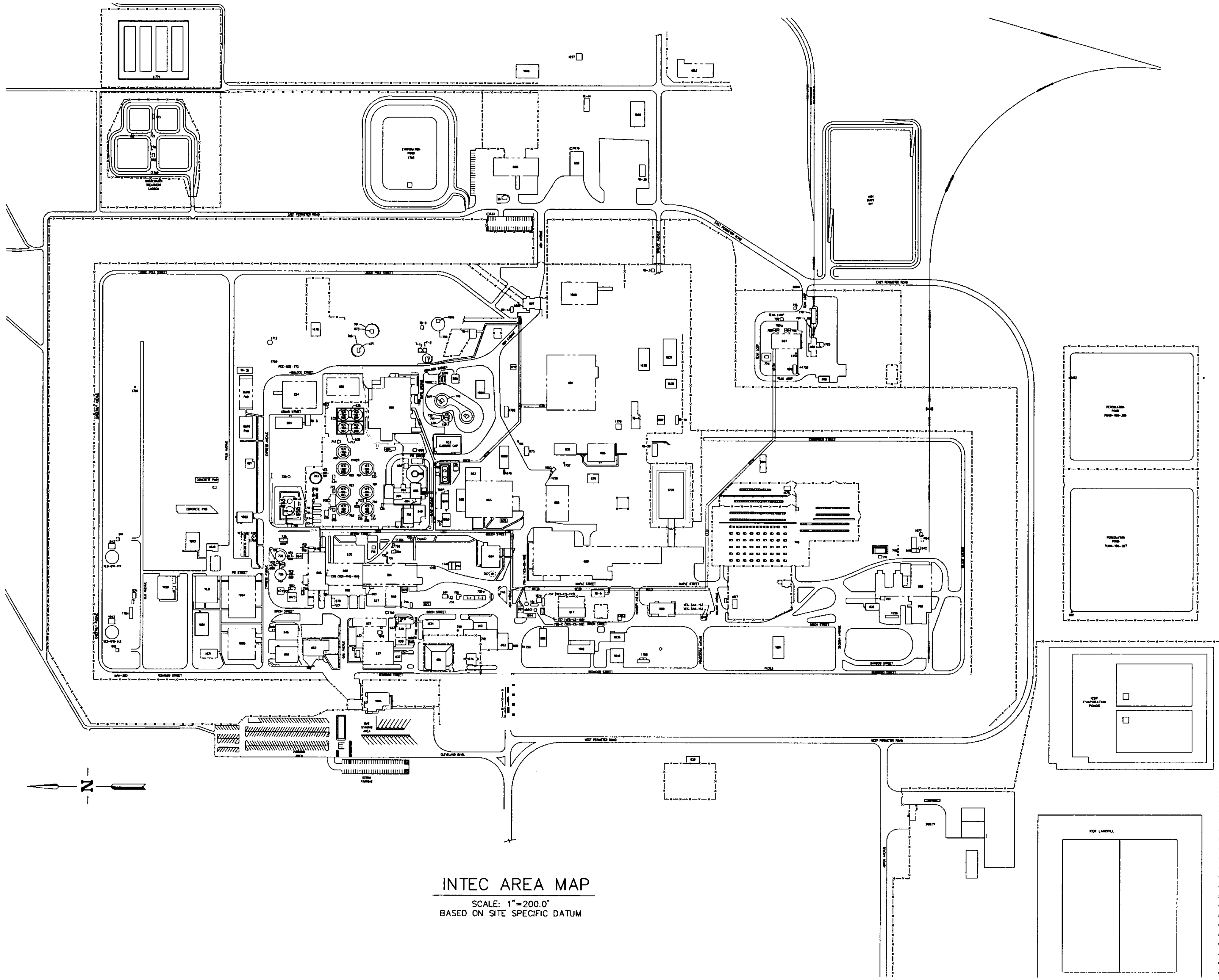


Figure 1-2. Map of the Idaho Nuclear Technology and Engineering Center (INTEC).

- Identify, gather, and review available historical information and other resources pertinent to INTEC water use and discharge practices, including active water system layout drawings within the Electronic Document Management System (EDMS).

- Identify, gather, and review available historical information and other resources pertinent to INTEC water use and discharge practices, including active water system layout drawings within the EDMS.

- Collect existing data and develop an INTEC water balance, including preparations of maps and identification of inputs and outputs for the various plant systems of concern.

- Determine schedule of operations/releases.

- Quantify input/output and discharge rates, and the uncertainty associated with existing metering/monitoring.

- Identify data gaps associated with quantifying facility discharges.

- Provide recommendations for improving current metering systems to better understand perched water recharge, including

  - Identify new methods and/or new types of metering/monitoring instrumentation for quantifying discharges.

  - Identify leaks needing repair.

  - Recommend facility practices to improve water use efficiency and minimize discharges.

- Identify planned infrastructure changes at INTEC that may affect facility discharges.

For information purposes only, tank farm vault water infiltration was assessed. This information is included in Appendix A and includes a description of the tank farm operations and construction, identification of possible sources of infiltration/seepage, and possible recommendations for the minimization of those sources.

1.2 Uses of Information

Information from this report will be used to make decisions concerning the operation and design of various systems within INTEC to achieve a higher level of certainty and reliability in monitoring the flows of water within the INTEC water systems. Information from this study and future monitoring data will also be utilized to update recharge components in the INTEC unsaturated zone model.

This information will also be used by the Department of Energy (DOE) to make decisions concerning the long-term disposition of INTEC to limit any possible impact on the SRPA and surrounding populations from past operations of INTEC.

1.3 Critical Assumptions

The following assumptions were made to complete this study:

- All system monitoring is maintained in a calibrated and functional condition with routine maintenance unless otherwise noted within this document.

- All documented parameters for the systems of concern are correct and reliable unless otherwise noted within this document.

2. BACKGROUND

INTEC is located in the south-central portion of the INEEL, as illustrated in the map of the INTEC area (see Figure 1-1). Construction of INTEC began in 1950, nuclear fuel storage operations began in 1952, and INTEC then conducted reprocessing of spent nuclear fuel from 1953 to 1981. From 1953 until INTEC calcination activities began, the liquid waste from fuel dissolution and extraction reprocessing activities, often extremely high in radioactivity (i.e., containing thousands of curies of activity), accumulated in the tank farm, a series of underground stainless steel tanks enclosed in underground concrete vaults. From 1963 to 1981, the Waste Calcining Facility (CPP-633) operated on a plant scale, receiving tank farm liquid waste for calcination (the conversion of liquid radioactive waste to a solid granular form). After the first calcining facility was closed, the New Waste Calcining Facility began operations. Until June 2000, liquid waste from the tank farm was transferred to the New Waste Calcining Facility (Building CPP-659).

2.1 Facility Description

The INEEL is a U.S. Government-owned facility under management of the DOE. The INEEL is located in the southeastern part of the State of Idaho approximately 52 km (32 mi) west of the city of Idaho Falls, ID. The INEEL Site encompasses 2,305 km^2 (890 mi^2) of the Snake River Plain. The INEEL's purpose is to provide facilities for nuclear research, development, and waste management.

INTEC occupies an approximate area of 210 acres within the perimeter fence and has been in operation since 1952. Until 1992, INTEC was utilized for the reprocessing of uranium from defense purposes and spent nuclear fuels, under the name of the Idaho Chemical Processing Plant (ICPP). After 1992, the DOE phased out reprocessing operations and, currently, INTEC is operated under a mission that is threefold: (a) receive and temporarily store spent nuclear fuels, (b) manage current and past wastes, and (c) perform remedial actions.

2.2 Previous Inventory Description

In 1993, a water inventory study was conducted for ICPP and the results were compiled in the *ICPP Water Inventory Study Project Summary Report* (WINCO 1994). The study focused mainly on the northern portion of INTEC. That was the area of concern for potential recharge to the northwestern perched water body, which was the only body of perched water not already associated with either the old percolation ponds or the sewage treatment plant and settling ponds. The 1993 study (WINCO 1994) consisted of

- A water inventory
- Identification of points of insufficient data for water inventory
- Leak testing of suspect systems
- Suggestions and implementation of changes to plant metering on various systems
- Identification of sources of seepage to tank vaults
- An estimation of natural recharge to perched water volumes.

A list of suggestions from the 1993 study report along with actions taken is included in Appendix B.

3. PLANT WATER BUDGET

This section discusses various water distribution and wastewater collection systems within INTEC that are considered to be potential contributors to perched water zones. Although eight water systems are listed, there are only two major sources of water input to INTEC and two main effluents from the facility. Appendix C contains miscellaneous information relating to monthly utilities and consumption reports referenced during this study.

3.1 Plant Water and Waste Systems

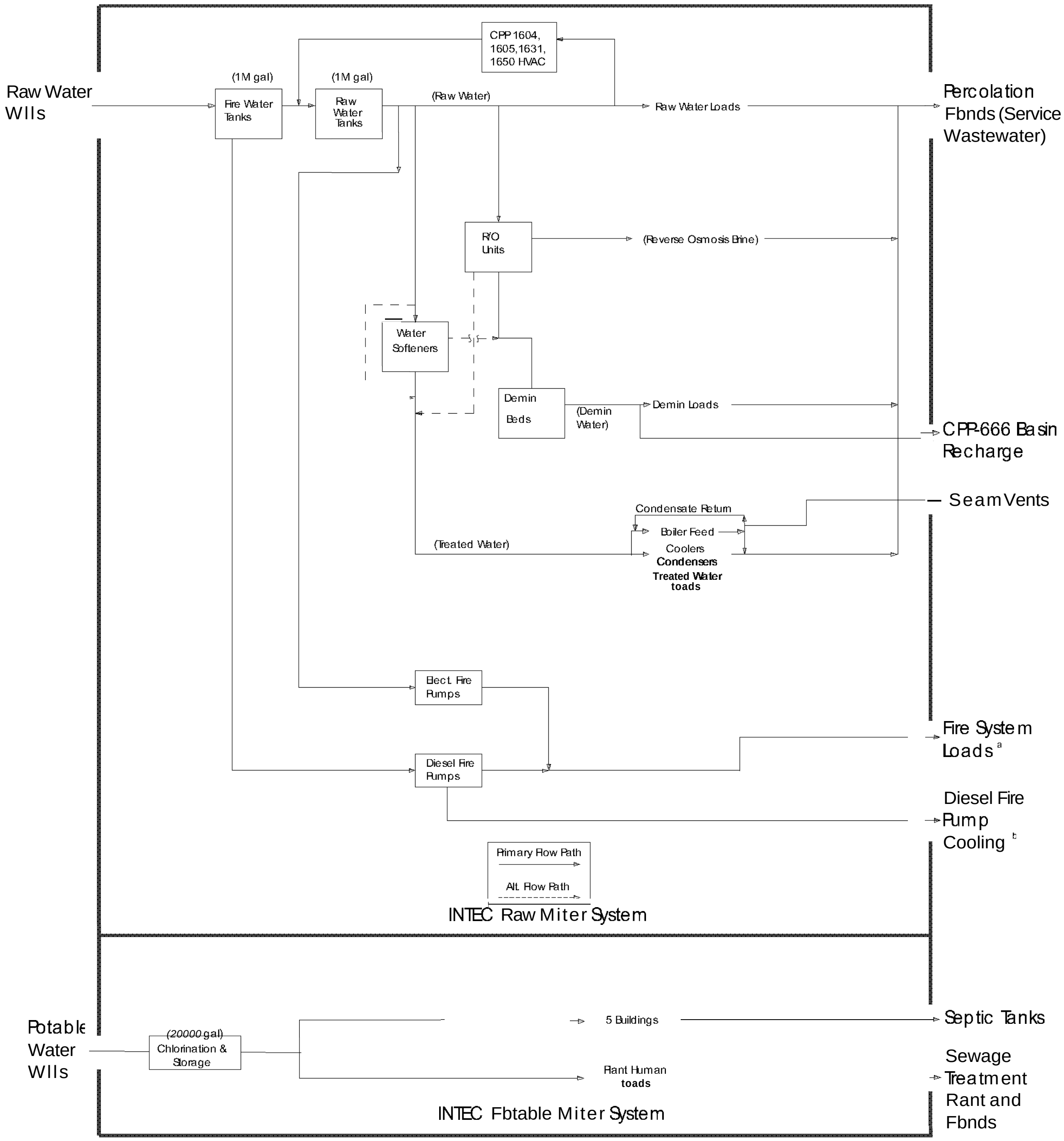
INTEC currently uses approximately 2 million gal of water per day on average. Water is supplied by four wells: two raw water wells and two potable water wells. This water is typically used for process cooling, equipment cooling, steam production, process solutions, decontaminations, fuel storage basin makeup, chemical laboratory needs, regeneration of ion exchange units, fire protection, and human needs such as drinking water, personal showers, food preparations, and restroom facilities. Piping systems external to facility buildings are either buried or placed in utility tunnels. Tunnels provide easy access to the piping systems and act as a secondary containment, allowing for continuous leak detection and monitoring. INTEC systems considered to be viable contributors to perched water recharge include (1) raw water, (2) firewater, (3) potable water, (4) treated water, (5) demineralized water, (6) steadcondensate, (7) sanitary sewer, and (8) service waste water. This section provides a brief description of each system. Maps of the distribution and collections systems for INTEC are included in Appendix D.

A simplified overview of how these systems work and interrelate is represented in the block diagram in Figure 3-1; the actual systems are complex with estimates of over 13 miles of interdependent piping. Despite the complexity of the piping systems within INTEC, the points of influent and effluent from the site are relatively simple.

Other waste systems associated with INTEC were not included in this study. These systems are regulated under the Hazardous Waste Management Act and the Resource Conservation and Recovery Act (HWMA/RCRA), have secondary contained piping, and are considered to be well monitored and tracked due to stringent controls.

3.1.1 Raw Water System

The raw water piping system has an approximate total length of 6,250 ft with an average flow of approximately 1,140 gpm, of which about 500 gpm is utilized as raw water. Figure D-1, Appendix D, shows the site plan of the raw water system. Raw water is pumped from the SRPA through two production wells to the firewater storage tanks. During normal operation, one of the two deep well raw water pumps is active and the second is on standby/backup. Raw water overflows from the firewater tanks through internal standpipes into two raw water storage tanks. Water level controls within the raw water tanks control the raw water pumps activity, shutting off the pump when the predetermined tank capacity is reached. This prevents overfilling the raw water tanks. Raw water overflow standpipes ensure that an adequate supply of firewater remains in storage at all times and allows flow through the tanks to prevent freezing. Raw water is supplied to INTEC to support operations and provide water for several other systems. Raw water is untreated, by definition. This fact results in the need for treating portions of raw water entering the facility to accommodate loads that would be adversely affected by the potential for scaling associated with untreated water.



a Loads include irrigation, heal pumps, sample coolers, evaporative coolers, CPP-603 basin recharge. firewater testing, fire suppression, diesel pump cooling water, gland leak-off, and other loads such as water tanker filling and other small domestic loads. Loads are applied by the electric fire pump OR the diesel firewater pumps, depending on the firewater system load

b Diesel firewater pump cooling load is dependant on diesel firewater pump operation

Figure 3-1. Idaho Nuclear Technology and Engineering Center (INTEC) systems block diagram.

3.1.2 Firewater System

The firewater piping system has an approximate length of 5 miles, with an average estimated flow of less than 15 gpm. This flow rate is not for fire suppression but for several small domestic loads supplied by the firewater system (e.g., building cooling, lawn sprinklers). Under normal operations, the electric firewater jockey pumps provide the required flow to maintain system pressure and accommodate minor loads. This flow is recorded and monitored on a flow totalizer strip recorder. Based on the strip recordings, the baseline flow for the system is less than 5 gpm in the summer, and approximately 25-30 gpm for freeze protection in the winter (freeze protection flow is directed to service waste). Diesel-driven firewater pumps will start upon system pressure drop to provide volumes needed for fire suppression or other increased system loads. Figure D-2 in Appendix D shows the firewater system site plan for INTEC. The firewater storage tanks are maintained full, and the firewater system is maintained at system pressure at all times to ensure the availability of fire protection to INTEC.

3.1.3 Potable Water System

The potable water piping system has a total length of approximately 2 miles, with an average flow of 26.3 gpm. Figure D-3 in Appendix D shows the site plan for the potable water system at INTEC. Potable water is supplied from the SRPA by two potable water wells. The potable water system includes a chlorination system, storage tank, and three distribution pumps.

The potable water piping system provides bacteria-safe water fit for human consumption, bathing, and sanitation to buildings of INTEC.

3.1.4 Treated Water System

The treated water piping system has an approximate length of 6,000 ft, with an average flow of 610 gpm. Figure D-4 in Appendix D shows the site plan for the treated water system for INTEC.

The treated water system accepts water from the raw water system and passes it though water softeners to reduce the hard water ions. Softened water is then utilized throughout the plant by systems and components that are adversely affected by scaling associated with raw water.

3.1.5 Demineralized Water System

The demineralized water piping system has an approximate length of 4,000 ft, with an average usage rate of approximately 1 gpm. Figure D-5 in Appendix D shows the site plan for the demineralized water system for INTEC.

The demineralized water system accepts water from the reverse osmosis unit or softened water treatment system and passes it through a bank of returnable demineralizer resin beds to remove the remaining hard water ions. The demineralized water is then directed to water loads that would be adversely affected by the presence of these ions.

Although the reverse osmosis system is considered its own system within the INTEC infrastructure, for the scope of this document it was considered to be a subsystem to the raw water system. Raw water is fed to the reverse osmosis filters from which the resulting filtrate can be directed to the demineralizer resin beds, the demineralized water system, or, atypically, the treated water system.

3.1.6 Steam Condensate System

The steam condensate piping system has an approximate total length of 4,200 ft, with an average flow of 74 gpm between September and April. Figure D-6 in Appendix D shows the site plan for the steam condensate at INTEC. Primary steam use occurs between September and April due to the seasonal demands, such as heating and freeze protection. Steam is supplied from Building CPP-606. Most steam generated at INTEC is either condensed and recycled, routed to the service waste system, or released to the environment as steam or water.

3.1.7 Sanitary Sewer System

The sanitary sewer piping system has an approximate total length of 1.5 miles, with an average flow rate of 24.5 gpm to the sewage treatment lagoons. Figure D-7 in Appendix D shows the piping site plan for the sanitary sewer system at INTEC. The sanitary sewer system is a gravity-drain system that accepts sanitary waste generated from the use of restrooms, showers, drinking fountains, janitorial sinks, office sinks, lunchrooms, and cafeterias from most of the buildings at INTEC and directs them to a sewage treatment system via lift stations.

3.1.8 Service Waste System

The service waste piping system has an approximate total length of 2 miles within INTEC, with an average flow of 983 gpm. Figure D-8 in Appendix D shows the site plan of the service waste system for INTEC. The service waste system is a gravity-fed system. Wastewater in the system gravity drains to lift stations where it is then pumped to the remote percolation ponds located southwest of INTEC. The percolation ponds are outside the area of concern for this study and were specifically located to remove them as a concern in regard to perched water under INTEC.

3.2 Operational Release Schedules

It is not standard practice to release plant water(s) to the environment within INTEC. Exceptions to this practice are lawn sprinkling, fire hydrant testing, maintenance, plant water for dust suppression, construction support, releases associated with normal operation of the steam system, and in some locations, discharges to septic systems. Following are more detailed descriptions of these releases.

3.2.1 Landscaping Water

From April through October, several lawns are maintained at INTEC. Currently, all landscaping water is provided by the firewater system with an estimated flow of 5,200 gal per day. These lawns are watered at night to limit losses to evaporation. Approximately 1.5 acres are maintained as lawns. The areas of currently maintained lawns are shown in Figure 3-2.

The quantity of water used for lawn watering was estimated using hardcopy records derived from flow recorder FR-UTI-682, located on the output of the firewater jockey pumps in CPP-606.

3.2.2 Fire Hydrant/System Testing

Fire hydrants within INTEC are tested yearly in accordance with National Fire Protection Association (NFPA) requirements. Testing is typically conducted in August. Water is released to the ground during this time from the cooling water load associated with the diesel motors of the diesel-driven firewater pumps. Figure 3-3 shows pictures of the cooling water released during this testing. Figure 3-2 shows the location of water flow within INTEC. Cooling water is also released to the ground weekly as the firewater pumps are run for 30 minutes once a week.

The quantity of water utilized for testing the fire hydrants, or the cooling water released, is not currently required to be quantified. During weekly testing, the coolant discharge is approximately 900 gal over a 30-minute period once a week, and approximately 54,000 gal over a 3-day period during fire hydrant flushing every August. The estimated volume of water discharged from the fire hydrants during yearly testing is 46,000 gallons (Fluke 2003). These discharges are either to the ground or are directed storm water drainage.

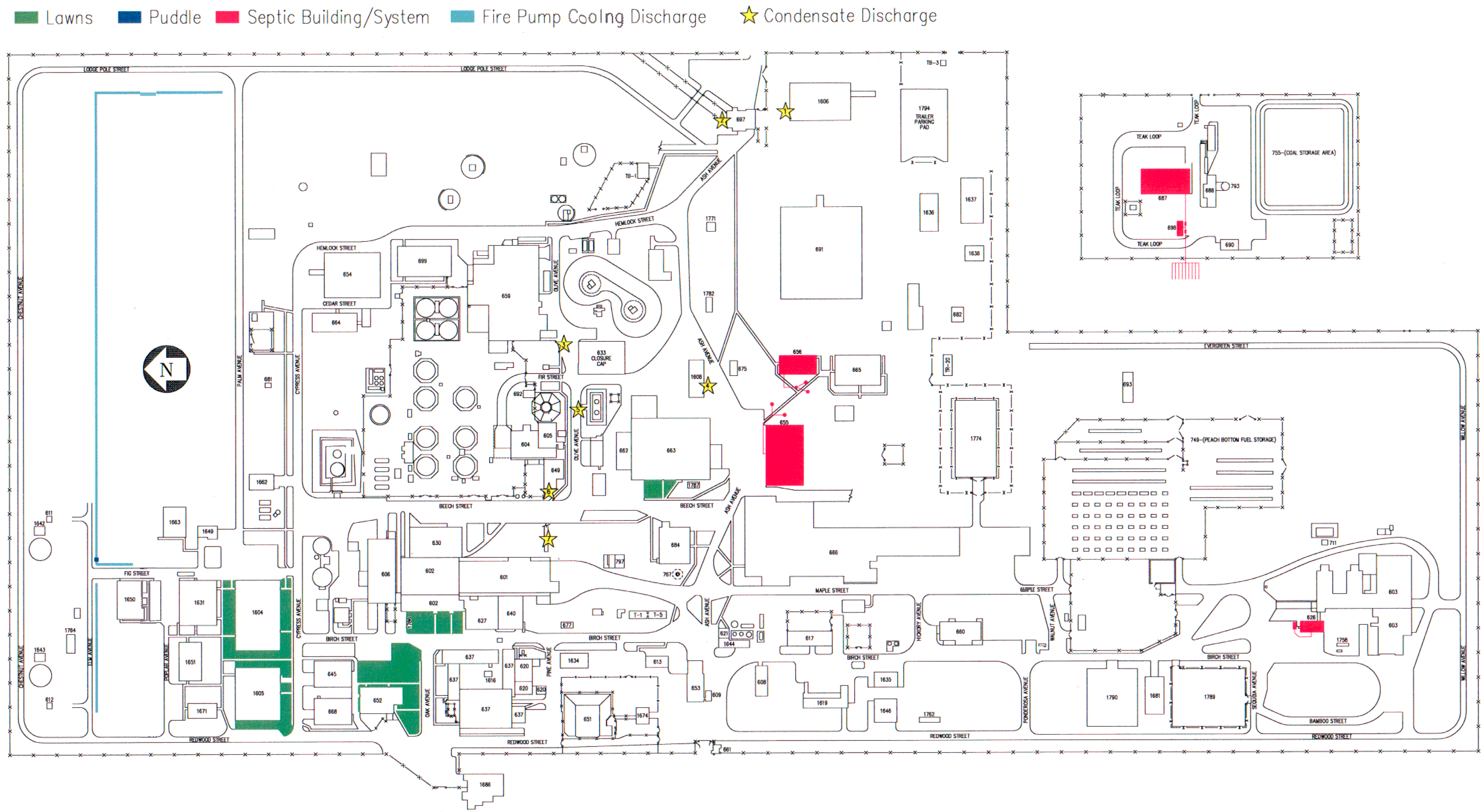


Figure 3-2. Idaho Nuclear Technology and Engineering Center (INTEC) locations of maintained lawns, septic systems, firewater pump cooling discharge, and condensate discharge.

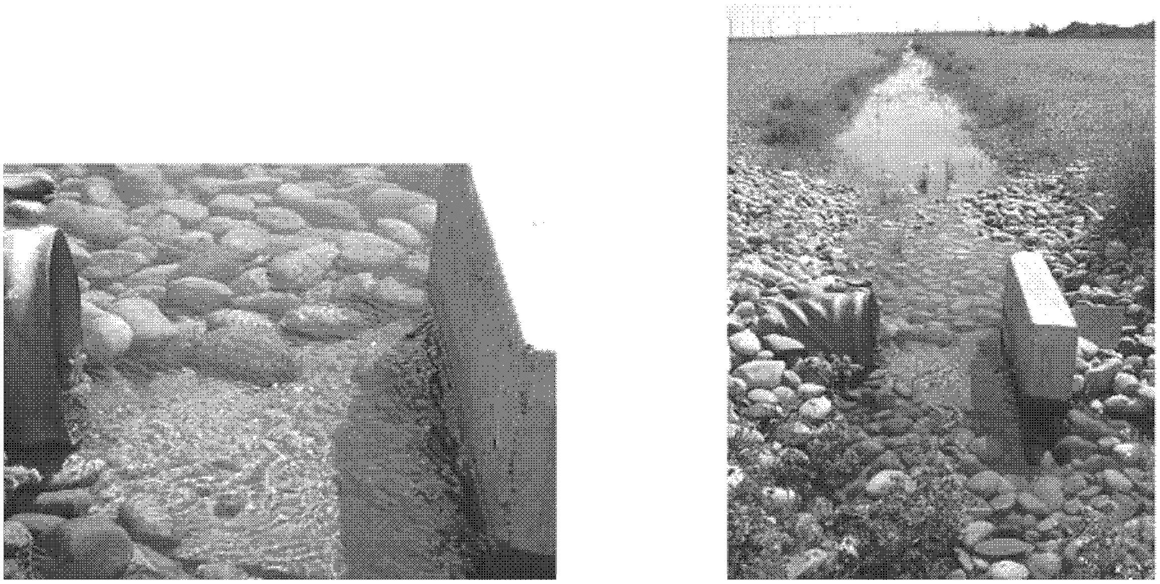


Figure 3-3. Photographs of firewater pump cooling water discharge on the north side of INTEC.

3.2.3 Dust Suppression and Construction Support

During normal operations, water from INTEC is utilized to support various construction projects, both in and around INTEC. Water is also used for dust suppression throughout INTEC. Dust suppression water is typically drawn from the firewater system at the coal-fired steam generation plant, located near the southeastern portion of INTEC. It is assumed the bulk of this water is not a consideration with respect to perched water bodies beneath INTEC but could affect the system water balance accuracy.

Water utilized for these purposes is currently not required to be quantified.

3.2.4 Steam System Releases

During the course of normal steam system operations, steam is released to the atmosphere as both steam and condensate due to blowdown. The bulk of this water is assumed to be released to the atmosphere as water vapor and is not a consideration with respect to perched water bodies beneath INTEC, but could affect the system water balance accuracy.

Currently, the quantity of water lost in operation of the steam system is not required to be quantified. Steam system discharges within INTEC were estimated in the *Comprehensive RI/FS for the Idaho Chemical Processing Plan OU 3-13 at the INEEL, Part A, RI/BRA Report (Final)* (DOE-ID 1997) (hereafter referred to as the RI/FS). Since this report was released, steam system discharges have been significantly decreased. Table 3-1 lists the previously identified discharges, along with the current status of each.

Steam condensate discharge locations identified during this study are listed in Table 3-2 and correspond with condensate discharges depicted in Figure 3-2. Discharge volumes listed in Table 3-2 are estimated. Phase II of this Water System Engineering Study (WSES) (DOE/ID-11115) will include a physical measurement to better estimate the discharges as applicable.

Table 3-1. Current status of steam condensate discharges listed in the Remedial Investigation/Feasibility Study.

Steam System ID	Location	Rate of discharge reported in the RIRS (gal/day)[a]	Current estimated rate of discharge (gal/day)	Current status
S-1	North of CPP-603	6	0	Abandoned in place
s-3	South of WCF Cap	2,160	0	Grouted and Abandoned in place
s-5	North of CPP-617	0	0	Abandoned in place
S-19	South of CPP-1644	1,344	0	Capped and abandoned in place
S-27	South of CPP-652	0	0	Not changed
S-40	East side of CPP-603	28	0	Abandoned in place
S-42	East side of CPP-603	5	0	Abandoned in place
s-45	Next to CPP-791	8	0[b]	Not currently in service
s-47	Next to CPP-765	8	0[b]	Not currently in service
s-49	Next to CPP-760	8	0[b]	Not currently in service
S-51	Next to CPP-795	8	0[b]	Not currently in service
S-63	Building CPP-641	15	0	Abandoned in place
S-76	East of CPP-660	288	0	Abandoned in place
S-78	North-east of CPP-603	144	0	Abandoned in place
s-180	Southwest corner of CPP-602	432	0	Directed to service waste
20	Located within CPP-637	28	0	Abandoned in place
21	Located at south of CPP-649	144	0	Currently no lines to this well
24	West side of CPP-603	1,008	0	Abandoned in place
26	Southeast corner of CPP-637	28	0	Abandoned in place
27	Southeast corner of CPP-601	144	0	Abandoned in place
28	East of Raw Water Tanks	28	0	Abandoned in place
30	North of CPP-660	432	0	Out of service
A-4 North	Northwest of CPP-756	0	0	Not changed
A-4 South	Northwest of CPP-756	0	0	Not changed
UT-01 through -48	Utility tunnels	Total discharges 2,013	Total discharges 80	Current utilities tunnel drawings and the steadcondensate P&IDs indicate that only two steam traps are still directed to french drains and have an estimated total flow of 80 gallons per day. The other steam traps located within the utilities tunnels have been directed back to the condensate return.

a. Values obtained or modified from DOEAD-10534, Table 2-2 (the RI/FS).
b. Value is currently 0, but the lines are available for future use, if needed.
CPP = Chemical Processing Plant (later referred to as ICPP, then as INTEC)
P&ID = piping and instrumentation diagram
RIRS = Remedial Investigation/Feasibility Study
UT = utility tunnel
WCF = Waste Calcining Facility

Table 3-2. Steam condensate discharge locations identified during this studv

Corresponding Number in Figure 3-2	Location	Estimated rate of discharge (gal/day)	Origin of discharge
1	Building CPP-1606	365[a,b]	Building heating system
2	Building CPP-697	365[a,b]	Building heating system
3	Utility tunnel under Olive Street	40"	Steam trap connected to steam line ½" CT-NN-156770
4	Building CPP-1608	365[a,b]	Building heating system
5	Utility tunnel under Olive Street	40"	Steam trap connected to steam line ½" CT-NN-156757
6	NW corner of Building CPP-649	40[d]	Steam drip leg associated with the steam line that crosses Beech Street
7	Approximately 125 ft west of Building CPP-649	40[d]	Steam drip leg associated with the steam line that crosses Beech Street

a. Discharge only occurs between the months of September through April

b. Value based on building properties and estimated heat loads (Brininger 2003).

c. Value based on average discharge of steam traps as listed in Table 2-2 of the Comprehensive RI/FS for ICPP (DOE-ID 1997).

d. Value based on visual estimation of discharge.

CPP = Chemical Processing Plant (original designation)
ICPP = Idaho Chemical Processing Plant (later renamed, now INTEC)
RI/FS = Remedial Investigation/Feasibility Study

3.2.5 CPP-603 and CPP-666 Basins

Basins are maintained for the storage of materials within Buildings CPP-603 and CPP-666. These basins are periodically recharged with water to maintain their water levels within the desirable range. CPP-603 basins are recharged with firewater and CPP-666 basins are recharged with demineralized water. No operational releases were identified for these basins. Because the CPP-666 basins are equipped with a leak detection system and based on information in EDF-2405, "CPP-603 Basin Water Level Review," basin recharge is conducted to compensate for natural evaporation and is not believed to be a significant recharge source to perched water bodies.

3.2.6 Septic System Releases

There are currently five buildings at INTEC that utilize septic tanks. These buildings were listed as low load buildings in the 1993 water inventory study (WINCO 1993a, 1994). Figure 3-2 depicts the buildings utilizing septic tanks within the fenced area of INTEC. Buildings CPP-687 and CPP-696 are associated with the coal-fired steam generation plant and are effectively abandoned at this time. Metcalf and Eddy (1991) report that per capita water use in an office for a commercial facility is typically 15 gal/person/day. The *ICPP Water Inventory Study Project Summary Report* (WINCO 1994) estimated normal human consumption of potable water at between 30-60 gallons per 8-hour shift. While this building is fully staffed, many of the current occupants work for Waste Generator Services (WGS) and are often working in the field. The building contains only two sets of restrooms and no shower facilities. Because of this, a per capita water usage rate of 30 gal/person/day was conservatively assumed. Assuming that sewage load is approximately equal to potable water load, an estimate of nonmetered water going to ground per day from the septic system associated with Building CPP-656 was determined to be

1,070 gal/day (assuming 50 occupants, 40-hour work week, 7 days per week). Other active buildings utilizing septic tanks are CPP-626, and CPP-655. About 11 people occupy Building CPP-655 during the day, and an estimated 5 people occupy Building CPP-626 during the day.

While these releases are not currently required for quantification, estimated discharges from building septic systems within the INTEC fence are listed in Table 3-3.

Table 3-3. Estimated septic discharges from buildings within the INTEC fence utilizing septic systems.

Building	Estimated number of occupants	Estimated rate of discharge based on usage rate of 30 gal/day, 40-hour work week, 7 days/week (gal/day)
CPP-656	50	1,070
CPP-655	11	235
CPP-626	5	110
CPP-687[a]	0	0
CPP-696[a]	0	0

a. Building is effectively abandoned at this time.

CPP = Chemical Processing Plant
INTEC = Idaho Nuclear Technology and Engineering Center

3.3 Water Balance Data Analysis and Summary

Existing data from the INTEC water systems were compiled and are reported in Table 3-4. These values were compiled from various sources. The values for potable water and raw water were obtained from the "Utilities Monthly Production and Consumption Reports" (Appendix C). Values for sewage were obtained from the INTEC Sewage Treatment Plant Flow Totalizer Readings Logs (Appendix C). Values for the service waste system were obtained from a spreadsheet of service waste flow rates compiled by INTEC personnel. Values for basin recharge were obtained from values logged in the CPP-666 operator logs. Demineralized water is used to provide makeup water to the CPP-666 basins. The value of this water is determined using the level change in water tank VES-FT-126, which provides a relatively reliable value.

Conducting an accurate long-term water balance is not possible with current information due to a lack of reliable data for raw and potable water, and due to a lack of data acquisition for various plant outlets (as shown in Table 3-4). New raw water meters were installed at the end of February 2003. The potable water meters were out of service for repair until late in 2002, and were not properly functional until April 2003. A lack of reliable data from the raw and potable water meters for supplying water to the plant limits data for this study from April through June 2003. The value of raw water was not listed for April on the "Utilities Monthly Production and Consumption Report" (Appendix C). The reason given for this omission was that the value was so high that the system owner did not have confidence in the reading (Hall 2003). Analyzing the data from April through June provides the information shown in Tables 3-5 and 3-6.

The data presented in Tables 3-5 and 3-6 indicate that due to a lack of output data and a lack of reliable input data, efforts to determine any notable imbalance in the water systems at INTEC would be inconclusive at this time. Note that input and/or output data are questionable because, in several instances, the overall outputs are significantly higher than the overall inputs.

Table 3-4.

								otable Water System	
	Inputs[b]	Outputs[b]					Inputs[b]	Outputs[b]	
	Raw Water Wells	Percolation Ponds (Service Waste)	Firewater System Loads[c]	Diesel Firewater Pump Cooling[d]	CPP-666 Basin Recharge	Steam System Losses	Potable Water Wells	Sewage Treatment Plant and Ponds (Sanitary Waste)	Septic Tanks"
Nov-01	OOC[f]	42,304,800	NQ[g]	NQ[g]	h	NQ[g]	OOC[f]	1,168,170	42,450
Dec-01	OOC[f]	48,816,599	NQ[g]	NQ[g]	h	NQ[g]	OOC[f]	987,040	43,865
Jan-02	OOC[f]	49,461,616	NQ[g]	NQ[g]	h	NQ[g]	OOC[f]	928,760	43,865
Feb-02	OOC[f]	38,048,892	NQ[g]	NQ[g]	h	NQ[g]	OOC[f]	786,604	39,620
Mar-02	OOC[f]	41,454,688	NQ[g]	NQ[g]	h	NQ[g]	OOC[f]	834,644	43,865
Apr-02	OOC[f]	34,391,700	NQ[g]	NQ[g]	h	NQ[g]	OOC[f]	819,300	42,450
May-02	OOC[f]	31,279,496	NQ[g]	NQ[g]	h	NQ[g]	OOC[f]	810,247	43,865
Jun-02	37,299,295	38,140,106	NQ[g]	NQ[g]	h	NQ[g]	648,130	1,026,480	42,450
Jul-02	67,379,061	44,708,517	NQ[g]	NQ[g]	h	NQ[g]	965,790	1,074,801	43,865
Aug-02	OOC[f]	43,563,000	NQ[g]	NQ[g]	h	NQ[g]	OOC[f]	1,260,708	43,865
Sep-02	OOC[f]	47,491,560	NQ[g]	NQ[g]	h	NQ[g]	OOC[f]	1,083,810	42,450
Oct-02	OOC[f]	44,513,303	NQ[g]	NQ[g]	h	NQ[g]	OOC[f]	1,002,912	43,865
Nov-02	93,077,672	49,305,100	NQ[g]	NQ[g]	h	NQ[g]	1,242,268	1,358,598	42,450
Dec-02	36,414,365	48,156,800	NQ[g]	NQ[g]	h	NQ[g]	1,657,239	1,249,023	43,865
Jan-03	OOC[f]	48,308,100	NQ[g]	NQ[g]	h	NQ[g]	OOC[f]	1,165,081	43,865
Feb-03	OOC[f]	42,861,400	NQ[g]	NQ[g]	h	NQ[g]	OOC[f]	1,263,690	39,620
Mar-03	30,245,000	43,787,700	NQ[g]	NQ[g]	h	NQ[g]	OOC[f]	1,466,643	43,865
Apr-03	54,075,000	40,835,300	NQ[g]	NQ[g]	10,406	NQ[g]	1,637,318	1,001,421	42,450
May-03	45,825,000	39,627,900	NQ[g]	NQ[g]	15,577	NQ[g]	1,154,155	1,074,376	43,865
Jun-03	46,232,000	42,864,800	NQ[g]	NQ[g]	26,763	NQ[g]	706,672	1,416,321	42,450
Jul-03	33,383,000	44,719,000	NQ[g]	NQ[g]	25,122	NQ[g]	903,583	1,512,108	43,865

a. Values are in gallons unless otherwise specified.

b. Data are considered to be questionable.

c. Loads include irrigation, heat pumps, sample coolers, evaporative coolers, CPP-603 basin recharge, firewater testing, fire suppression, diesel firewater pump cooling water, gland leak-off, and other loads such as water tanker filling and other small domestic loads. Loads are supplied by the electric firewater pump OR the diesel firewater pumps, depending on the firewater system load.

d. Diesel firewater pump cooling load is dependent on diesel firewater pump operation.

e. Data are derived from values estimated in Table 3-3.

f. OOC denotes that equipment for monitoring was out of commission.

g. NQ denotes that data are insufficient for quantification.

h. Data not compiled for this report.

	Inputs[a]	Outputs[a]						Raw Water Balance
	Raw Water Wells	Percolation Ponds (Service Waste)	Firewater System Loads[b]	Diesel Firewater Pump Cooling[c]	CPP-666 Basin Recharge	Steam System Losses	Total Outputs	(Total Inputs)-(Total Outputs)
Apr-03	54,075,000	40,835,300	NQ[d]	NQ[d]	10,406	NQ[d]	NQ[d]	Not possible due to lack of data
May-03	45,825,000	39,627,900	NQ[d]	NQ[d]	15,577	NQ[d]	NQ[d]	Not possible due to lack of data
								Not possible due to lack of data
								Not possible due to lack of data

b. Loads include irrigation, heat pumps, sample coolers, evaporative coolers, CPP-603 Basin recharge, firewater testing, fire suppression liesel firewater pump cooling water, gland leak-off, and other loads such as water tanker filling and other small domestic loads. Loads are supplied by the electric firewater pump OR the diesel firewater pumps, depending on the firewater system load.

c. Diesel firewater pump cooling load is dependent on diesel firewater pump operation.

d. NQ denotes that data are insufficient for quantification.

Table 3-6. Potable water system values and derived data.

	Inputs[a]	Outputs[a]			Potable Water Balance[a]
	Potable Water Wells	Sewage Treatment Plant and Ponds (Sanitary Waste)	Septic Tanks[b]	Total Outputs	(Total Inputs)-(Total Outputs)
Apr-03	1,637,318	1,001,421	42,450	1,043,871	593,447
May-03	1,154,155	1,074,376	43,865	1,118,241	35,914
Jun-03	706,672	1,416,321	42,450	1,458,771	c
Jul-03	903,583	1,512,108	43,865	1,555,973	c

a. Data are considered to be questionable.

b. Data are derived from values estimated in Table 3-3.

c. Data point would be unreasonable.

Meters utilized for information to derive the overall INTEC water balance contained within this report were identified, and vendor data for each meter were reviewed to assess if the current meters were operating within an accuracy level that would be considered acceptable for current technology levels. Table 3-7 lists the accuracies reported by the vendor for each brand of meter.

Table 3-7. Meter accuracies.

Svstem	Manufacturer	Full-scale Accuracv
Raw water	Controlotron	1%-2%
Potable water	Dieterich Standard Annubar	1%
Service waste	Westfall	0.01%
Sewage treatment	Panametric DF868-1	0.5%-1%

Assuming meters are calibrated and operating correctly, the accuracies are within normal industry standards and would not account for significant variations in quantities of water being supplied and discharged from INTEC.

3.4 Conclusions

This section identifies suspected data gaps and provides recommendations to improve INTEC water system metering and to minimize system discharges that may affect perched water bodies beneath INTEC.

3.4.1 Identification of Suspected Data Gaps

- Following are brief descriptions of data gaps identified during this study that affect the ability to monitor system discharges and to develop a defensible water balance. There is an overall lack of reliable data for quantities of raw water and potable water being pumped at INTEC. Identification of the following data gaps stem from the discovery of meter maintenance problems, lack of metering, and unreasonable existing data.

3.4.1.1 Raw and Firewater Systems

- The value for raw water used at INTEC is derived by subtracting the value of treated water from the value of total raw water pumped from the wells. This formula has the disadvantage of compounding possible errors from meters associated with this process.

- Currently, water is from the firewater system at the coal-fired steam generation plant via truck for use in construction support and dust suppression. From discussions with operations personnel, this load can be considerable, depending upon construction demands and climatic conditions. Currently, there is no required monitoring of this load (unquantified loss from the system).

- In the 1993 water balance and inventory study, the addition of a flow totalizer on the outlet from the firewater jockey pumps was recommended to quantify water being utilized from the firewater system during normal operations (WINCO 1994). This flow totalizer was installed into the system and designated F-UTI-682. There is no current requirement to report data from the associated strip recorder. There is also no current requirement to meter the outlet of the diesel-driven firewater pumps.

- Currently, water is being supplied from the firewater system to the CPP-603 basins to provide makeup for natural evaporative losses. The quantity of this water is not reported. The value of water added to the CPP-603 basins is estimated from level change during filling.

- During a walk-through of INTEC, a steady stream of water was noted coming from the pipe in the ditch at the corner of Elm Avenue and Fig Street. This discovery was made prior to the fire hydrant flushing operations noted earlier. Investigation of the system indicates the leak-off from the packing glands of the diesel-driven firewater pumps is the most likely source of this flow. The flow rate is estimated at 1/2 to 1 gpm. This is believed to be a constant stream due to the presence of algae growth and water bugs in the puddle formed by this stream, as shown in Figure 3-4. Figure 3-2 shows the location of the puddle created from the steady stream within INTEC. This indicates a release to ground surface of about 263,000-526,000 gal of water per year, which could contribute to perched water recharge in the northern part of INTEC.

3.4.1.2 Steam System

- Several locations were identified in the steam condensate system where unmonitored condensate water is allowed to go to the ground. Table 3-2 summarizes these discharges to the ground. While discharges from the steam condensate system can be estimated, the overall losses to the atmosphere and to any possible leaks cannot currently be quantified.

3.4.1.3 General

- An underground 50,000-gal brine storage vault is associated with the treated water system, designated as CPP-736. Currently, no means exist to quantify possible leakage from this tank. The tank contains a concentrated sodium chloride solution; thus, the possibility for tank degradation exists.

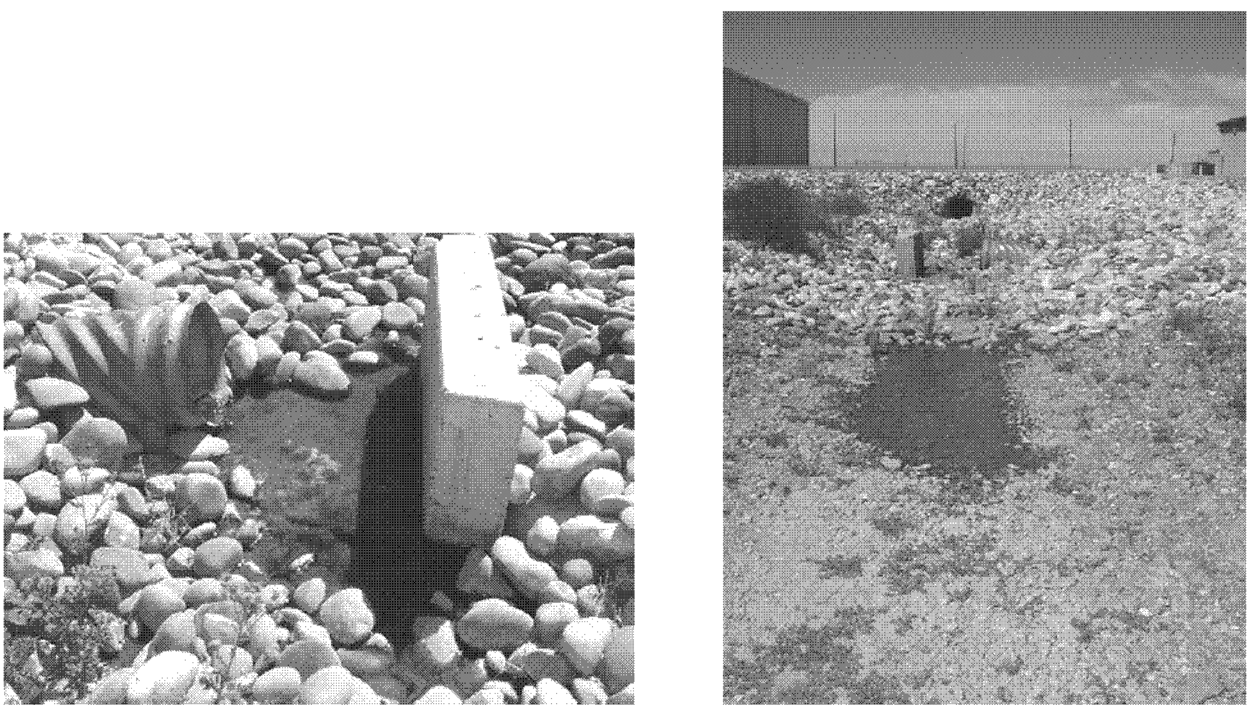


Figure 3-4. Permanent puddle photographs.

- There is a boiler-feed tank located within Building CPP-606. This tank is not currently required to be monitored for leaks.

3.4.2 Recommendations

Based on the findings and data gaps discovered during this study, recommendations have been developed to provide guidance on improving INTEC water balance capabilities and reporting, and to decrease water discharges that could impact perched water zones beneath the facility. These recommendations are reported in two categories: (1) monitoring upgrades and (2) operations and reporting. Recommendations are prioritized based on professional judgment within their respective categories and are reported in Tables 3-8 and 3-9.

Table 3-8. Prioritized recommendations for "monitoring upgrades" at the Idaho Nuclear Technology and Engineering Center (INTEC).

Priority	Recommendation	Description/Basis
1	Utilize/install data loggers on primary input and output systems of the plant. This includes utilizing data logging capabilities of flow totalizers as available.	The installation of data loggers on the primary input and output systems of the plant will aid in maintaining a running plant water balance. Collected data will also assist in timely identifications of system problems, and will aid in validating monthly data values. This includes logging flow data from the electric firewater pumps, which is not currently reported.
2	Install a flow meter on the outlet of the diesel-driven firewater pumps.	The only firewater system flow recorded is from the electric firewater pumps. When the diesel-driven firewater pumps are used, the flow from these pumps is not monitored.
3	Log volumes OR install a flow meter in the line used to fill trucks at the inactive coal-fired steam generation plant.	Water used in and around INTEC for dust suppression and construction support is sometimes taken from connections at the inactive coal-fired steam generation plant. This volume is derived from the firewater system and is not monitored.
4	Log volumes OR install a flow meter in the line used to fill the CPP-603 basins.	Currently, the volume of water used as makeup to the CPP-603 basins is estimated and not included in water usage reports.
5	Install a flow meter on the boiler feed make-up line.	The installation of a flow meter on the boiler feed make-up line will provide the make-up rate to the steam condensate system.
6	Install flow meters to monitor the direct raw water used on lines 10" RW-NR-152863 and 8" RW-NR-152862.	Direct raw water usage is currently derived by subtracting various water loads from the total raw water pumped. Direct metering of this water would provide a more accurate balance and would aid in pinpointing system leaks and/or problems.
7	Install a new flow meter on the treated water system to replace the existing meter.	The metering system used to measure the flow of treated water is out of date and its accuracy is questionable. The installation of a new flow meter that measures full flow is recommended.

A schedule with planned implementation dates of recommendations listed in Tables 3-8 and 3-9, and with the planned date for compiling new data and producing a follow-up report is shown in Table 3-10. The follow-up report will include a water balance of the INTEC water systems using data collected by newly installed metering equipment and/or other means recommended in this document.

Table 3-9. Prioritized recommendations for "operations and reporting" at the Idaho Nuclear Technology and Engineering Center (INTEC).

Priority	Recommendation	Description/Basis
1	Create and maintain a monthly water balance log and tracking system.	A monthly water balance report generated from input and output data (as shown in Tables 3-5 and 3-6) will provide an overall system balance and will aid in identifying problems associated with the water systems at INTEC.
2	Identify an individual who will serve as a central task lead for system accountability, maintenance, and data management and reporting.	The development of a system to assign responsibility, perform and track maintenance, prioritize needed repairs, and maintain and report data is recommended. This will help ensure any data gaps associated with the operations of these systems will be minimized.
3	Control the discharge from the diesel-driven firewater pumps packing gland cooling.	The leak-off from the diesel-driven firewater pumps that provides cooling for the packing gland is discharged to the ground. This discharge to the ground could be eliminated by installing mechanical seals to replace the packing glands, if appropriate.
4	Control discharge from the diesel-driven firewater pumps engine cooling water.	During operation of the diesel-driven firewater pumps, the engine cooling flow is directed to ground. This discharge to the ground can be evaluated by installing weirs in the ditch. Install one weir near the discharge point, one prior to discharge into the evaporation pond culvert, and one between these two locations. This will aid in determining final disposition of discharge water (evaporation pond, infiltration, etc.).
5	Control discharges during yearly fire hydrant testing.	To prevent water discharges to the ground, fire hydrant discharges should be directed to lined ditches or to storm water drains, as appropriate, within the facility.
6	Reduce or eliminate maintained lawns.	Due to concerns of perched water bodies beneath INTEC, maintained lawns should be reduced or eliminated as a possible contributor to these perched water bodies.
7	Include a system-wide leak check of the firewater system during the firewater system assessment that is conducted every 5 years.	Currently, the firewater system is assessed every 5 years to ensure it meets the requirements for INTEC as determined by National Fire Protection Association standards. The assessment provides data for indication of system leakage, but only addresses the system's ability to provide firewater. This data should be utilized to identify and quantify possible leakage.

Table 3-10. Planned implementation dates of recommendations.

Task Identification	Target Completion Date
Complete installation and testing of new monitoring equipment.	*9130104*
Complete evaluation and implementation decision for “operations and reporting” recommendations.	*9130104*
Complete evaluation using weirs of firewater pump coolant water ditch.	*9130105*
Complete data collection from INTEC water system monitoring equipment.	*9130105*
Complete the WSES-II follow-up report	*5130106*

INTEC = Idaho Nuclear Technology and Engineering Center
WSES = Water System Engineering Study

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Appendix A

Tank Farm Vault Water Infiltration Assessment

A. TANK FARM VAULT INFILTRATION

The INTEC Tank Farm Facility includes 15 below-ground stainless steel tanks, a control house, several ancillary buildings, condenser pits, valve boxes, and tank and vault risers. Tanks WM-180 through -190 have a capacity of 300,000 gal each. Four of these tanks (WM-182, WM-183, WM-185, and WM-186) have been emptied and rinsed. There are also four inactive tanks that have a capacity of 30,000 gal (WM-103 through WM-106) each. As shown in Figure A-1, the four tanks are located north of WM-182.

The eleven 300,000-gal tanks are similar in design. Each has a 50-ft diameter, an overall height of about 30-32 ft, and is contained in an unlined, underground concrete vault. The vault floors are about 45 ft below grade. The three basic designs of the vaults are described below:

- Monolithic octagon. The two oldest tanks, WM-180 and WM-181, were constructed from 1950 to 1953 and are contained in poured-in-place, monolithic octagonal concrete vaults.

- Pillar and panel octagon. Tanks WM-182 to -186 were constructed from 1953 to 1957 and are contained in octagonal vaults constructed of precast concrete pillars and panels. The precast pillar and panel design is considered the least structurally sound of the three basic designs and, therefore, are expected to be closed first with the exception of Tank WM-185, which has been designated as an emergency spare.

- Monolithic square. Tanks WM-187 to -190 were constructed from 1959 to 1965 and are contained in a poured-in-place, monolithic square vault sectioned into four concrete vaults.

The four inactive 30,000-gal tanks (WM-103 through WM-106) were constructed in 1954 and are stainless steel below-ground tanks, placed on reinforced concrete pads and covered by compacted gravel. Unlike the 300,000-gal tanks, the 30,000-gal tanks do not have vaults. The 30,000-gal tanks were emptied to their heels and taken out of service in 1983. While the inlets to the tanks were later cut, the outlets are still operational, allowing tank decontamination.

Each vault contains one to three sumps and associated steam jet pumps to remove any liquid waste or surface water that may leak into the vault. Each sump is equipped with liquid-level instrumentation and high-level alarms to monitor levels within the sump. Between September 2001 and July 2003, a total of 26,502 gal of liquid were pumped from the vaults. There are several possible sources of liquid infiltrating into the sumps. This section focuses on identifying sources of infiltration into the vaults.

A.l Tank Vault Transfers

Each vault has one to three sumps to collect liquid infiltrating into the vault. Vaults for Tanks WM-180 and WM-181 have one sump. Vaults for Tanks WM-182 to WM-188 have two sumps, and vaults containing Tanks WM-189 and WM-190 have three sumps. Sumps designated with an "N" or **"S"** are "hot" sumps placed under the tanks and respectively correspond to either the north or south half of the tank. Sumps designated with a "C" correspond to "cold" sumps and lie between the outside of the tank and the outside wall of the vault. The cold sumps are isolated from the hot sumps by a 6-in.-high concrete curb. Each sump contains a steam jet, outlet pipe, and instrumentation to monitor and remove liquid as needed. If a sump requires pumping, the liquid is transferred to holding tank WL-133 and is then transferred for treatment in the process equipment waste (PEW) system. The volumes transferred are recorded and tracked internally. Table A-1 includes a summary of the information recorded from Form INTEC-6401 from September 2001 to July 2003.

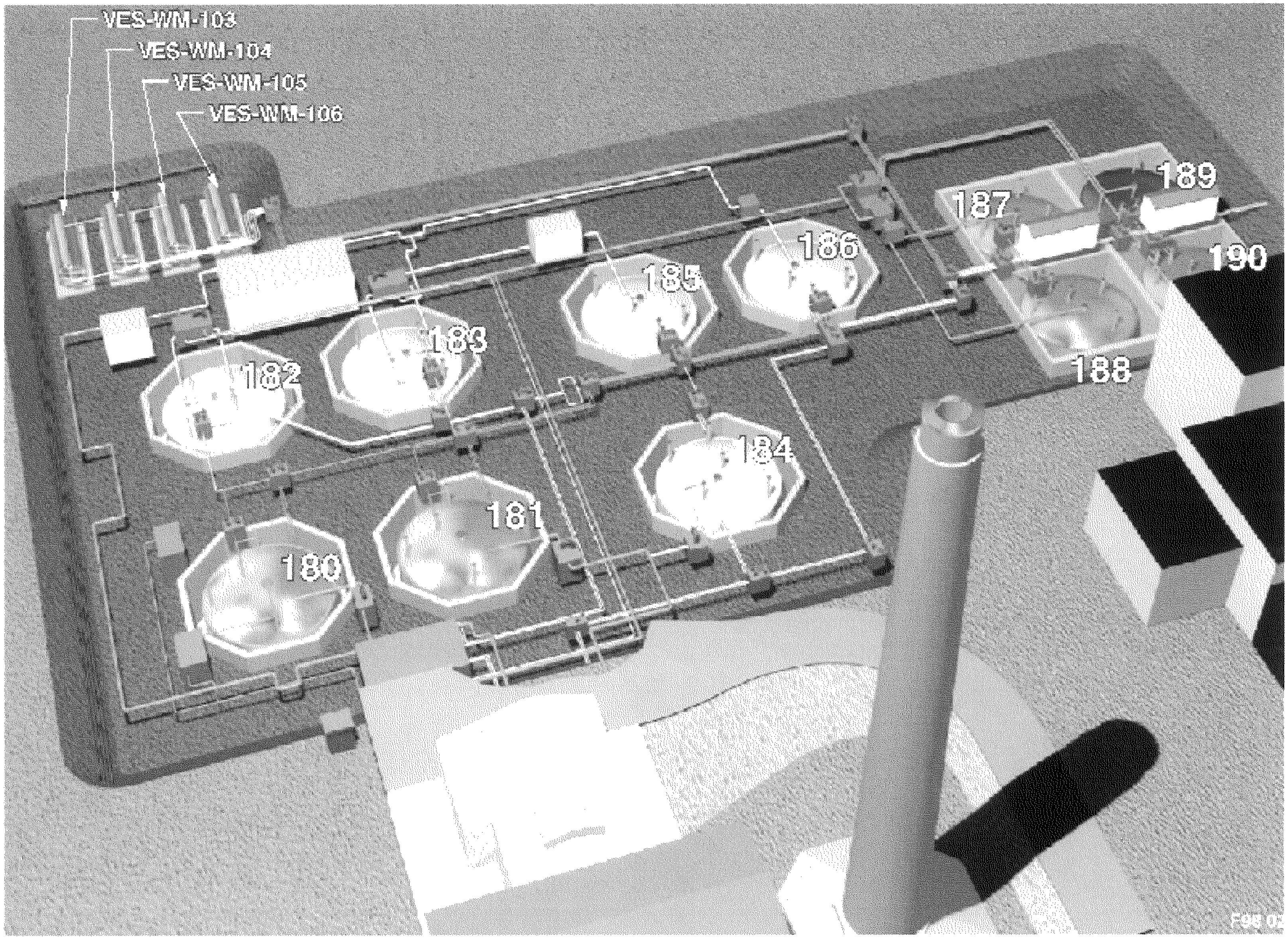

Figure A-1. Tank farm conceptual drawing.

Table A-1. Gallons of liquid transferred from tank vault sumps at the Idaho Nuclear Technology and Engineering Center (INTEC) from September 2001 to July 2003

	Sump Number																						Total Monthly Volumes
	180S	181S	182N	182S	183N	183S	184N	184S	185N	185S	186N	186S	187N	187S	188N	188S	189C	189N	189S	190C	190N	190S	
Sep 01	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	0
Oct 01	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	0
Nov 01	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	0
Dec 01	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	786		218	773	1,777
Jan 02	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	0
Feb 02	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	1,802	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	1,802
Mar 02	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	758	—[a]	—[a]	1,875	—[a]	842	—[a]	—[a]	1,918	—[a]	—[a]	5,393
Apr 02	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	866	—[a]	580	—[a]	1,439	—[a]	—[a]	689	1,474	—[a]	937	87	—[a]	6,072
May 02	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	102	981	1,083
Jun 02	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	0
Jul 02	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	756	—[a]	—[a]	630	—[a]	—[a]	1,386
Aug 02	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	40	—[a]	—[a]	40
Sep 02	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	1,385	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	576	876	—[a]	—[a]	2,837
Oct 02	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	0
Nov 02	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	0
Dec 02	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	1,233	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	1,233
Jan 03	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	0
Feb 03	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	0
Mar 03	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	0
Apr 03	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	488	—[a]	—[a]	488
May 03	—[a]	—[a]	—[a]	643	—[a]	3	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	1,667	—[a]	—[a]	1,048	—[a]	—[a]	1,030	—[a]	—[a]	4,391
Jun 03	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	0
Jul 03	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	
Sump totals	0	0	0	643	0	3	0	0	0	2,251	0	1,338	0	4,908	[illegible]	0	3,335	1,474	1,362	5,919	407	1,754	26,502

a. No data reported.

Between September 2001 and July 2003, a total of 26,502 gal of liquid were pumped from the tank vaults. Table A-2 shows 84% of the volume came from Vaults 187, 188, 189, and 190, with Vault 190 contributing the most (30.5%). Vaults 187 to 190 all lie within the monolithic square vault sectioned into four vaults located on the east end of the tank farm.

To reduce the volume of liquid infiltrating into the vaults, it is necessary to first identify the sources of infiltration.

A.2 Sources of Infiltration

Sources of infiltration into the tank farm vaults may include

1. Precipitation
2. Irrigation
3. Shallow, perched groundwater
4. Leaks in adjacent piping systems
5. Leaks in tanks
6. Leaks in the cooling system.

Each of these is discussed below.

Table A-2. Gallons of liquid transferred from tank vaults from September 2001 to July 2003.

	Vault	Gallons Transferred	% of Total Volume	East Vaults %
	180	0	0%	
	181	0	0%	
	182	643	2%	
	183	3	0%	Portion of total volume originating from Vaults 187, 188, 189, and 190 = 22,267 gal or 84% of total volume transferred.
	184	0	0%	
	185	2,251	9%	
	186	1,338	5%	
	187	4,908	19%	
	188	3,108	12%	
	189	6,171	23%	
	190	8,080	30%	
Total volume transferred		26,502 gal	100%	

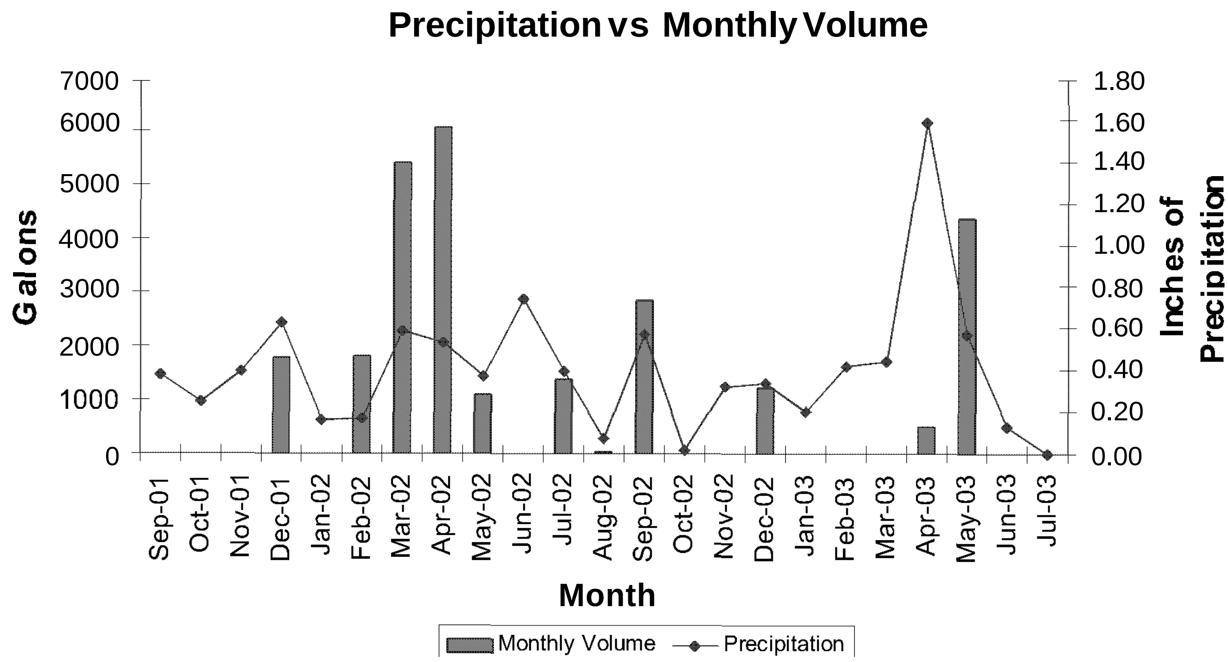

Figure A-2. Precipitation and volume of liquid pumped from the vaults from September 2001 to July 2003.

A.2.1 Precipitation

The average annual precipitation accumulation for INTEC is 8.72 in. From September 2001 to July 2003, a total of 9.26 in. of precipitation accumulated at INTEC. Figure A-2 shows the distribution of precipitation from September 2001 to July 2003. Precipitation was suspected to add to infiltration of the vaults. As a result, in 1977 the Tank Farm Facility was covered with an impermeable membrane, crowned, and graded to surrounding drainage ditches to facilitate drainage. However, liquid continued to infiltrate into the tank vaults. To confirm if precipitation was still infiltrating into the tank vaults, in 1981, a tracer study was performed by placing a fluorescein dye along the east edge of the impermeable membrane (WINCO 1993). The tracer did show up in Vaults 189 and 190, which confirmed precipitation could infiltrate into the vaults from beyond the membrane. Tank farm operations personnel have noted the largest influx of infiltration into vaults usually occurs during the spring after the snow pack melts." Table A-1 shows the monthly distribution of liquid pumped from the tank vaults from September 2001 to July 2003.

The monthly distribution of liquid pumped from the vaults does indicate a large influx of liquid infiltrating into the vaults during the spring of 2002 and following a large precipitation event in April 2003. Figure A-2 shows the relationship between the precipitation and volume of liquid pumped from the vaults from September 2001 to July 2003. The timing of the large influx of infiltration following spring thaw and the large precipitation event of April 2003 indicate the majority of the infiltration may be derived from precipitation.

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a. Personal communication between John Trudnowski, MSE, and Dave Machovec, BBWI, August 21,2003.

Pathways for the precipitation infiltration may be through tears in the membrane, seams around penetrations for instrumentation and piping, and precipitation outside the edge of the membrane. The most likely point of entry of infiltration into the tank vaults is through seams between the roof panels.

A.2.2 Irrigation

Irrigation can be ruled out as a source of infiltration because no areas near the tank farm currently receive irrigation. There was an irrigated lawn on the west side of Building CPP-699, which was near the east end of the tank farm; however, the lawn was removed in 1994 to eliminate the possibility of infiltration.

A.2.3 Shallow Perched Groundwater

The U.S. Geological Survey drilled 20 monitoring wells in the tank farm in 1973 and 1975 to evaluate the possibility of groundwater seeping into the tank vaults. The results from the water level data in the tank farm area indicate there is no shallow, perched groundwater in the area to seep into the tank vaults (WINCO 1993).

A.2.4 Leaks From Adjacent Piping

The potable water, sanitary sewer, and firewater systems have pipes that run into the northwest side of Building CPP-699, which is near the east end of the tank farm. Leaks from these systems could be contributing to the infiltration in the tank vaults.

A.2.5 Leaks From VES-WM Tanks

Liquid from the vessel-waste management (VES-WM) tanks placed in the vaults could be leaking into the vaults. However, it is unlikely because tank levels are closely monitored and no leakage from the tanks has been detected (see Figure **A-1).**

A.2.6 Leaks From the Cooling System

Each tank is equipped with a cooling system that could leak into the tank vaults. The cooling system is closely monitored and no leaks into the vaults have been detected.

A.3 Conclusions and Recommendations

The infiltration data suggest the most likely source for infiltration into the tank vaults is from precipitation seeping through tears and seams in the impermeable membrane and around the edge of the membrane. The evidence to support this is the large amount of liquid transferred from the sumps every spring and after large precipitation events. Leaks from the tanks and cooling system are unlikely because the systems are closely monitored and no leaks have been found. Leaks from the adjacent potable water, sewer, and firewater system are possible but are undetermined at this time.

To determine if water is leaking into the tank vaults from the adjacent potable and firewater system, the parts of the systems closest to the tank farm could be isolated and pressure-tested. If a leak is present, then it is possible the potable or firewater system could be a contributing source of infiltration. To determine if the sanitary sewer is leaking, the water transferred from tank vaults could be sampled for coliform bacteria. If the samples are positive, then the sanitary sewer is leaking into the tank vaults.

A.4 References

WINCO, 1993, *Analysis of ICPP Tank Farm Infiltration*, WINCO-1183, Idaho National Engineering and Environmental Laboratory, October 1993.

Appendix B

Concerns, Findings, and Actions Taken During the 1993 ICPP Inventory Study

Table B-1. Concerns, findings, and actions taken during the 1993 Idaho Chemical Processing Plant inventory study.[a]

Concern	Findings	Actions taken
System leakage	4-gpm leak on a fire hydrant	Work package was issued and hydrant was repaired.
	12-gpm leak on a service line of firewater	Work package was issued and pipe was repaired.
	0.15-gpm leak on potable water supply line	Work package was issued and leak was addressed.
Potable water meter	The potable water meter providing totalized flow was located in Building CPP-606, leaving the piping from the wells to CPP-606 unmetered.	A meter was purchased and installed into the system near the wellheads.
Firewater meter	Firewater discharge was noted as being unmetered.	A meter was purchased and installed on the outlet of the firewater jockey pumps, but the discharge from the diesel-driven firewater pumps is still unmetered.
Sewage waste meter	A portion of the sewage waste stream was found to be unmetered.	A meter was purchased and installed to ensure all flow was metered.
Raw water metering	The placement of the raw water meter was distant from the well head, so piping was left unmetered, and a portion of recirculated water was left unaccounted for.	A project to separate the major water systems was undertaken, which included the installation of metering at the wellheads of the raw water pumps.

a. WINCO, 1994, *ICPP Water Inventory Study Project Summary Report*, WINCO-118 1, Idaho National Engineering and Environmental Laboratory, January 1994.

Appendix C

Utilities Monthly Production and Consumption Reports

FORM INTEC-5436 (10/27/00)
REV 6

UTILITIES MONTHLY PRODUCTION 8 CONSUMPTION REPORT

This data sheet is the current revision date per the current Form Index.

Signature / Date

Month: December 2001 | Issue Date: 01-16-02

PRODUCED			CONSUMED		
Oil Produced Steam	27.100,352	lbs	Diesel	91	gal
Peak Steam Load	41,000	pph	Fuel Oil	229,664	gal
Compressed Air	65,352,960	cu ft.	Propane	2.224	gal
Potable Water		gal	Salt	70,000	lbs
Demineralized Water	96,180	gal	Electricity	4,436,896	kwh
Treated Water	30,208,000	gal	Sulfuric Acid	501	gal
Raw/Fire Water	**	gal	Sodium Hydroxide	0	gal
Sewage Plant Effluent	810,533	gal			

RECEIVED			ON HAND		
Diesel	115	gal	Diesel	3,177	gal
Fuel Oil	286,444	gal	Fuel Oil	138,308	gal
Pmpane	2.346	gal	Propane	2,429	gal
Salt	70.000	Lbs			

BOILER	FUEL USED GALLONS
8-UTI407	0
B-UTI-608	72.360
B-UTI-609	
8-UT1610	56,662
B-UTI-611	100.642

TOTAL 229,664 (Gallons) ÷ 31 (Days) = 7,408 (Fuel consumed daily)

NOTE: Tolal fuel consumed must not exceed 29,976 gallons a day per Air Permit PTC-#023-00001.

'Potable water flow meter out of service **Raw water totalizer out of service

Distribution: K. Willoughby 5106 R. Rivard 5117 J. Hand 5231 S. Rogers 5230 R. Garton 5230 S. Camahan 5230
M. MacConnel 5117 J. Cleveland 5224 E. Fossum 3870 Kathy Neil 3870

FORM INTEC-5436 (10/27/00) REV 1

UTILITIES MONTHLY PRODUCTION & CONSUMPTION REPORT

This data sheet is the current form on date per the current Form Index

Signature / Date

Month January 2002 Issue Date

PRODUCED			CONSUMED		
Oil Produced Steam	25,896,988	lbs	Diesel	125	gal
Peak Steam Load	50,000	pph	Fuel Oil	219,466	gal
Compressed Air	65,844,000	cu ft.	Propane	6,310	gal
Potable Water		gal	Salt	62,380	lbs
Demineralized Water	88,660	gal	Electricity	4,403,002	kwh
Treated Water	22,267,000	gal	Sulfuric Acid	238	gal
Raw/Fire Water	**	gal	Sodium Hydroxide	0	gal
Sewage Plant Effluent	1,167,304	gal			

RECEIVED			ON HAND		
Diesel	75	gal	Diesel	3,127	gal
Fuel Oil	236,866	gal	Fuel Oil	155,708	gal
Propane	6,390	gal	Propane	2,509	gal
Salt	62,380	Lbs.			

BOILER	FUEL USED GALLONS
6-UTI-607	0
8-UTI-608	53.962
&UTI-609	858
6-UTI-610	105,434
6-UTI-611	59.212
TOTAL	219,466

219,466 Gallons ÷ 31 Days = 7079 Fuel consumed daily

NOTE. Total fuel consumed must not exceed 29.976 gallons a day per Air Permit PTC-#023-00001.

'Potable water flow meter out of service **Raw water totalizer out of service

Distribution: K. Willoughby 5106 R. Rivard 5117 J. Hand 5231 S. Rogers 5230 R. Garton 5230 S. Carnahan 5230 M. MacConnel 5117 J. Cleveland 5224

FORM INTEC-5436 (10/27/00)
REV. 6

UTILITIES MONTHLY PRODUCTION 8 CONSUMPTION REPORT

This date shall be the current revision date per the current Form Index

Signature / Date

Month February 2002 Issue Data

PRODUCED			CONSUMED		
Oil Produced Steam	23,309,720	lbs	Diesel	254	gal
Peak Stem Load	53,000	pph	Fuel Oil	107.540	gal
Compressed Air	55,198,000	cu ft	Propane	6.160	gal
Potable Water		gal	Salt	69,620	lbs
Demineralized Water	46.510	gal	Electricity	4.114,454	kwh
Treated Water	27,865,000	gal	Sulfuric Acid	373	gal
Raw/Fire Water	**	gal	Sodium Hydroxide	0	gal
Sewage Plant Effluent	***	gal			

RECEIVED			ON HAND		
Diesel	272	gal	Diesel	3,145	gal
Fuel Oil	109.200	gal	Fuel Oil	67,368	gal
Propane	6.303	gal	Propane	2,652	gal
Salt	69,620	Lbs.			

BOILER	FUEL USED GALLONS
8-UTI-607	0
B-UTI-608	67,197
B-UTI-609	0
B-UTI-610	65.745
B-UTI-611	64.598.

TOTAL 197,540 Gallons ÷ 28 Days = 7,055 Fuel consumed daily

NOTE: Total fuel consumed must not exceed 29.976 gallons a day per Air Permit PTC-#023-00001.

'Potable water Row meter out of service **Raw water totalizer out of service ***Sewage totalizer out of service

Distribution: K. Willoughby 5106 R. Rivard 5117 J. Hand 5231 S. Rogers 5230 R. Garton 5230 S. Carnahan 5230
M. MacConnel 5117 J. Cleveland 5224

FORM INTEC-5436 (10/27/00)
REV. 6

UTILITIES MONTHLY PRODUCTION & CONSUMPTION REPORT

This data sheet is the current revision date per the current Form Index

Signature / Date

Month March 2002 Issue Date April 16, 2002

PROOUCEO			CONSUMED		
Oil Produced Steam	20.102,126	lbs	Diesel	166	gal
Peak Steam Load	41.300	pph	Fuel Oil	170,357	gal
Compressed Air	65.085,120	cu ft.	Propane	6,043	gal
Potable Wafer		gal	Salt	139.800	lbs
Demineralized Water	52.350	gal	Electricity	5,317.776	kwh
Treated Water	28,060,000	gal	Sulfuric Acid	110	gal
Raw/Fire Water	**	gal	Sodium Hydroxide	0	gal
Sewage Plant Effluent	***	gal			

RECEIVED			ON HAND		
Diesel	106	gal	Diesel	3,085	gal
Fuel Oil	139,798	gal	Fuel Oil	36.809	gal
Propane	5,725	gal	Propane	2,334	gal
Salt	139.800	Lbs.			

BOILER	FUEL USED GALLONS
B-UTI-607	0
B-UTI-608	52,013
B-UTI-609	711
8-UTI-620	43,205
B-UTI-611	74.428

TOTAL 170,357 Gallons ÷ 31 Days = 5,495 Fuel consumed daily

NOTE: Total fuel consumed must not exceed 29.976 gallons a day per Air P m i IPTC-#023-00001.

'Potable water flow meter out of service ''Rawwater totalizer out of service *** Sewage totalizer out of service.

Distribution: K. Willoughby 5106 R. Rivard 5117 J. Hand 5231 S. Rogers 5230 R. Garton 5230 S. Camahan 5230
M. MacConnel 5117 J. Cleveland 5224

FORM INTEC-5436 (10/27/00)
REV. 6

UTILITIES MONTHLY PRODUCTION & CONSUMPTION REPORT

This data sheet is the current revision date per the current Form Index:

Signature / Date

Month April 2002 Issue Date 5-29-02

PRODUCED			CONSUMED		
Oil Produced Steam	12,736,440	lbs	Diesel	539	gal
Peak Steam Load	31.000	pph	Fuel Oil	107,936	gal
Compressed Air	65,793,600	cu ft.	Propane	2,244	gal
Potable Water	•	gal	Salt	139.720	lbs
Demineralized Water	12,248	gal	Electricity	4,040,741	kwh
Treated Water	24,680,000	gal	Sulfuric Acid	228	gal
Raw/Fire Water		gal	Sodium Hydroxide	0	gal
Sewage Plant Effluent		gal			

RECEIVED			ON HAND		
Diesel	214	gal	Diesel	2,760	gal
Fuel Oil	158,716	gal	Fuel oil	87,589	gal
Propane	2.147	gal	Propane	2,837	gal
salt	139.720	Lbs.			

BOILER	FUEL USED GALLONS
8-UTI-607	0
B-UTI-608	42.613
6-UTI-609	7.785
B-UTI-610	5,741
B-UTI-611	51,799
TOTAL	107,936

107,936 Gallons + 30 Days = 3,597 Fuel consumed daily

NOTE: Total fuel consumed must not exceed 29,976 gallons a day per Air Permit PTC-#023-00001.

'Potable water flow meter out of service ''Raw water totalizer out of service

Distribution: K. Willoughby 5106 R. Rivard 5117 J. Hand 5231 S. Rogers 5230 R. Garton 5230 S. Camahan 5230
M. MacConnel 5117 J. Cleveland 5224

FORM INTEC-5436 (10/27/00)
REV. 6

UTILITIES MONTHLY PRODUCTION & CONSUMPTION REPORT

This data sheet is the current revision date per the current Form Index

Signature / Date

Month May2002 Issue Dale 6/18/02

PRODUCED		
Oil Produced Steam	9,176,388	lbs
Peak Steam Load	22,000	pph
Compressed Air	66,914,360	cu ft.
Potable Water		gal
Demineralized Waler	43,080	gal
Treated Water	25,351,000	gal
Raw/Fire Waler	**	gal
Sewage Plant Effluent	297.756	gal

CONSUMED		
Diesel	195	gal
Fuel Oil	77,766	gal
Propane	1,950	gal
Salt	71,280	ibs
Electricity	3,202,416	kwh
Sulfuric Acid	228	gal
Sodium Hydroxide	0	gal

RECEIVED		
Diesel	144	gal
Fuel Oil	117,700	gal
Pmpane	1,678	gal
Salt	71280	Lbs.

ON HAND		
Diesel	2.709	gal
Fuei Oil	127.523	gal
Propane	2.765	gal

BOILER	**FUEL USED GALLONS**
B-UTI-607	0
B-UTI-608	40,063
B-UTI-609	0
B-UTI-610	0
B-UTI-611	37,703
TOTAL	77,766

TOTAL 77,766 Gallons + 31 Days = 2,508 Fuel consumed daily

NOTE: Total fuel consumed must not exceed 29.976 gallons a day per Air Permit PTC-#023-00001.

*Potable water flow meter out of service **Raw water totalizer aut of service

Distribution: K. Willoughby 5106 R. Rivard 5117 J. Hand 5231 S. Rogers 5230 R. Garton 5230 S. Camahan 5230
M. MacConnel 5117 J. Cleveland 5224

FORM INTEC-5436 (10/27/00)
REV 6

UTILITIES MONTHLY PRODUCTION & CONSUMPTION REPORT

This data sheet is the current revision date per the current Form Index:

Signature / Date

Month June 2002 Issue Date July 11, 2002

PRODUCED			CONSUMED		
Oil Produced Steam	4,834,106	lbs	Diesel	23	gal
Peak Steam Load	10,000	pph	Fuel Oil	40,967	gal
Compressed Air	63,590,400	cu ft.	Propane	270	gal
Potable Water	648,130	gal	Salt	140,880	lbs
Demineralized Water	46,050	gal	Electricity	3,513,082	kwh
Treated Water	20,585,000	gal	Sulfuric Acid	428	gal
Raw/Fire Water	16,714,295	gal	Sodium Hydroxide	0	gal
Sewage Rent Effluent	281,105	gal			

RECEIVED			ON M D		
Diesel	103	gal	Diesel	2,789	gal
Fuel Oil	69,405	gal	Fuel Oil	155.961	gal
Propane	0	gal	Propane	5,495	gal
Salt	140.880	Lbs			

BOILER	FUEL USED GALLONS
E-UTI407	0
B-UTI-608	12,222
6-UTI409	6.562
8-UTI-610	4.050
B-UTI-611	18,133
TOTAL	40,967 Gallons + 30 Days = 1,366 Fuel consumed daily

NOTE: Total fuel consumed must not exceed 29.976 gallons a day per Air Permit PTC-#023-00001.

High raw water usage because of ICDF project

Distribution: K. Willoughby 5106 R. Rivard 5117 J. Hand 5231 S. Ropers 5230 R. Garton 5230 S. Carnahan 5230
M. MacConnel 5117 J. Cleveland 5224

FORM INTEC-5436 (10/27/00)
REV. 6

UTILITIES MONTHLY PRODUCTION 8 CONSUMPTION REPORT

This data sheet is the current revision date per the current Form Index.

Signature / Date

Month July 2002 Issue Date 8/27/02

PRODUCED			CONSUMED		
Oil Produced Steam	3,102,928	lbs	Diesel		gal
Peak Steam Load	4.000	pph	Fuel Oil	26.296	gal
Compressed Air	65,710,080	cu ft	Propane	53	gal
Potable Water	965,790	gal	Salt	70.000	lbs
Demineralized Water	86,660	gal	Electricity	3,798,245	kwh
Treated Water	27,838,000	gal	Sulfuric Add	436	gal
Raw/Fire Water	39,501,061	gal	Sodium Hydroxide	0	gal
Sewage Plant Effluent	275,824	gal			

RECEIVED			ON HAND		
Diesel	*	gal	Diesel	3.102	gal
Fuel Oil	10,000	gal	Fuel Oil	139,665	gal
Propane	0	gal	Propane	2.442	gal
Salt	70.000	Lbs			

BOILER	FUEL USED GALLONS
B-UTI-607	0
B-UTI-608	3.299
B-UTI-609	6.151
B-UTI-610	15.822
8-UTI-611	1,024
TOTAL	26,296 Gallons ÷ 31 Days = 848 Fuel consumed daily

NOTE Total fuel consumed must not exceed 29,976 gallons a day per Air Permit PTC-#023-00001

*Amount of diesd received not correct

Distribution: K. Willoughby 5106 R. Rivard 5117 J. Hand 5231 S. Rogers 5230 R. Garton 5230 S. Carnahan 5230
M. MacConnel 5117 J. Cleveland 5224

FORM INTEC-5436 (10/27/00)
REV 6

UTILITIES MONTHLY PRODUCTION & CONSUMPTION REPORT

This data sheet is the current revision date per the current Form Index

Signature / Date

Month August 2002 Issue Date 9/16/02

PRODUCED			CONSUMED		
Oil Produced Steam	2,958,968	lbs	Diesel	175	gal
Peak Steam Load	5,700	pph	Fuel Oil	25.076	gal
Compressed Air	64,058,400	cu ft.	Propane	97	gal
Potable Water	*	gal	Salt	70.820	lbs
Demineralized Water	51,400	gal	Electricity	3,747,942	kwt
Treated Water	24,621,000	gal	Sulfuric Acid	319	gal
Raw/Fire Water	**	gal	Sodium Hydroxide	0	gal
Sewage Plant Effluent	356.312	gal			

RECEIVED			ON HAND		
Diesel	226	gal	Diesel	3155	gal
fuel Oil	58,898	gal	Fuel Oil	241.780 ***	gal
Propane	0	gal	Propane	2.315	gal
salt	70,820	Lbs.			

BOILER	FUEL USED GALLONS
B-UTI-607	0
6-UTI-608	6.512
B-UTI-609	5,417
B-UTI-610	8,854
B-UTI-611	4,293
TOTAL	25.076 Gallons + 31 Days = 808 Fuel consumed daily

NOTE: Total fuel consumed must not exceed 24.976 gallons a day per Ak Permit PTC-#023-00001.

'Potable water flow meter out of service **Raw water totalizer out of service ***Meter Correction

Distribution: K. Willoughby 5106 R. Rivard 5117 J. Hand 5231 S. Rogers 5230 R. Garton 5230 S. Camahan 5230
M. MacConnel 5117 J. Cleveland 5224

FORM INTEC-5436 (10/27/00)
REV. 6

UTILITIES MONTHLY PRODUCTION 8 CONSUMPTION REPORT

This data sheet is the current revision date per the current Form Index

Signature / Date

Month September 2002 Issue Date 10/17/02

PRODUCED			CONSUMED		
Oil Produced Steam	3,642,070	lbs	Diesel	770	gal
Peak Steam Load	11.000	pph	Fuel Oil	30.865	gal
Compressed Air	60.739,200	cu ft	Propane	157	gal
Potable Water		gal	Salt	***	lbs
Demineralized Water	75,010	gal	Electricity	3,200,120	kwh
Treated Water	28.892,000	gal	Sulfuric Acid	445	gal
Raw/Fire Water	**	gal	Sodium Hydroxide	0	gal
Sewage Plant Effluent	375,450	gal			

RECEIVED			ON HAND		
Diesel	741	gal	Diesel	3,126	gal
Fuel Oil	15.000	gal	Fuel Oil	225,915	gal
Propane	764	gal	Propane	2,952	gal
Salt	0	Lbs.			

BOILER	FUEL USED GALLONS
B-UTI-607	
B-UTI-608	0
B-UTI-609	6.912
8-UTI-610	7,990
8-UTI-611	15,963
TOTAL	30,865

30,865 Gallons + 30 Days ■ 1.028 Fuel consumed daily

NOTE Total fuel consumed must not exceed 29,976 gallons a day per Air Permit PTC-#023-00001.

*Potable water flow meter out of service **Raw water totalizer out of service *** Salt usage unknown

Distribution: K. Willoughby 5106 R. Rward 5117 J. Hand 5231 S. Rogers 5230 R. Garton 5230 S. Carnahan 5230
M. MacConnel 5117 J. Cleveland 5224

FORM INTEC-5436 (10/27/00)
REV. 6

UTILITIES MONTHLY PRODUCTION & CONSUMPTION REPORT

This data sheet is the current revision date per the current Form index

Signature / Date

Month October 2002 Issue Date 11-18-02

PRODUCED			CONSUMED		
Oil Produced Steam	11,930,744	lbs	Diesel	***	gal
Peak Steam Load	31,600	pph	Fuel Oil	101,108	gal
Compressed Air	66,647,520	cu ft.	Propane	***	gal
Potable Water	787,516	gal	Salt	71,040	lbs
Demineralized Water	66,690	gal	Electricity	4,365,040	kwh
Treated Water	30,677,000	gal	Sulfuric Acid	648	gal
Raw/Fire Water	**	gal	Sodium Hydroxide	0	gal
Sewage Plant Effluent	583,647	gal			

RECEIVED			ON HAND		
Diesel	4,755	gal	Diesel	11,955	gal
Fuel Oil	89,801	gal	Fuel Oil	214,608	gal
Propane	1,550	gal	Propane	2,963	gal
Salt	71,040	Lbs.			

140 710
39 812
36.750
217,472
oil outside
Readings

BOILER	FUEL USED GALLONS
B-UTI-607	
B-UTI-608	16.574
8-UTI-609	70,684
8-UTI-810	13,850
8-UTI-611	0
TOTAL	101,108 Gallons ÷ 31 Days = 3,261 Fuel consumed daily

NOTE. Total fuel consumed must not exceed 29.976 gallons a day per Air Permit PTC-#023-00001.

Raw water totalizer out of service * Because of new vessels, amount consumed undetermined

Distribution: K. Willoughby 5106 R. Rivard 5117 J. Hand 5231 S. Rogers 5230 R. Garton 5230 S. Camahan 5230
M. MacConnel 5717 J. Cleveland 5224

FORM INTEC-5436 (10/27/00)
REV. 6

UTILITIES MONTHLY PRODUCTION & CONSUMPTION REPORT

This data sheet is the current revision date per the current Form Index:

Signature / Date

Month November 2002 Issue Date 1-27-03

PRODUCED			CONSUMED		
Oil Produced Sleam	19,311,526	lbs	Diesel	1,295	gal
Peak Steam Load	42,720	pph	Fuel Oil	103.657	gal
Compressed Air	64,670,400	cu ft.	Propane	2.651	ga!
Potable Water	1,242,268	gal	Salt	71.060	lbs
Demineralized Water	51.120	gal	Electricity	4.181.000	kwh
Treated Water	29,166,000	gal	Sulfuric Acid	261	gal
Raw/Fire Water	63,911,672	gal	Sodium Hydroxide	0	gal
Sewage Plant Effluent	994,292	gal			

RECEIVED			ON HAND		
Diesel	454	gal	Diesel	11.014	gal
Fuel Oil	168.717	gal	Fuel Oil	219,668	gal
Propane	3,234	gal	Propane	3,546	gal
Sal:	71.060	Lbs.			

BOILER	FUEL USED GALLONS
B-UTI-607	
B-UTI-608	0
B-UTI-609	73,887
E-UTI-610	60,414
6-UTI-611	29,356
TOTAL	163,657

163,657 Gallons + 30 Days = 5.455 Fuel consumed daily

NOTE: Total fuel consumed must not exceed 29.976 gallons a day per *Air* Permit PTC-#023-00001.

Distribution: K. Willoughby 5106 R. Rivard 5117 J. Hand 5231 S. Rogers 5230 R. Garton 5230 S. Carnahan 5230
M. MacConnel 5117 J. Cleveland 5224

FORM [redacted] (10/27/00)
REV. 5

UTILITIES MONTHLY PRODUCTION 8 CONSUMPTION REPORT

This data sheet is the current revision date per the current Form Index:

Signature / Date

Month December 2002 Issue Dale 1/27/2003

PRODUCED			CONSUMED		
Oil Produced Sleam	20,962,996	lbs	Diesel	273	gal
Peak Steam Load	36,000	pph	Fuel Oil	177,822	gal
Compressed Air	68,031,360	cu fl.	Propane	3,899	gal
Potable Water	1,657,239	gal	salt	70,329	lbs
Demineralized Water	64,460	gal	Electricity	4,363,800	kwh
Treated Water	27,287,000	gal	Sulfuric Acid	351	gal
Raw/Fire Water	9,127,365	gal	Sodium Hydroxide	0	gal
Sewage Plant Effluent	1,032,101	gal			

RECEIVED			ON HAND		
Diesel	0	gal	Diesel	10,741	gal
Fuel Oil	205,874	gal	Fuel Oil	247,720	gal
Pmpane	3,730	gal	Propane	3,377	gal
Salt	70,320	Lbs.			

BOILER	FUEL USED GALLONS
B-UTI-607	0
B-UTI-608	75.791
8-UTI-609	59.907
&UTI-61 0	33.714
B-UTI-611	8.410
[redacted]	177,822

177,822 Gallons ÷ 31 Days = 5,736 Fuel consumed daily

NOTE: Total fuel consumed must not exceed 29,976 gallons a day per Air Permit PTC-#023-00001.

Distribution: K. Willoughby 5106 R. Rivard 5117 J. Hand 5231 S. Rogers 5230 R. Garton 5230 S. Camahan 5230 M. MacConnel 5117 J. Cleveland 5224

FORM INTEC-5436 (10/27/00)
REV. 6

UTILITIES MONTHLY PRODUCTION & CONSUMPTION REPORT

This data sheet is the current revision date per the current Form Index

Signature / Date

Month January 2003

Issue Date 2/18/2003

PRODUCED			CONSUMED		
Oil Produced Steam	20,717,142	lbs	Diesel	502	gal
Peak Steam Load	44,000	pph	Fuel Oil	175,569	gal
Compressed Air	57,406,400	cu ft.	Propane	4,568	gal
Potable Water	*	gal	Salt	69 280	lbs
Demineralized Water	19,100	gal	Electricity	4,843,100	kwh
Treated Water	28,969,000	gal	Sulfuric Acid	274	gal
Raw/Fire Water	**	gal	Sodium Hydroxide	0	gal
Sewage Plant Effluent	805,061	gal			

RECEIVED			ON HAND		
Diesel	151	gal	Diesel	10,380	gal
Fuel Oil	158,501	gal	Fuel Oil	230,652	gal
Propane	4,311	gal	Propane	3,100	gal
Salt	69.280	Lbs.			

BOILER	FUEL USED GALLONS
B-UTI-607	0
6-UTI-608	65.641
B-UTI-609	17.888
B-UTI-610	85.096
B-UTI-611	6.944
TOTAL	175.669

175.669 Gallons + 31 Days = 5,664 Fuel consumed daily

NOTE: Total fuel consumed must no: exceed 29,976 gallons a day per Air Permit PTC-#023-00001.

*Potable water flow meter out of service **Raw water totalizer out of service

Distribution: K. Willoughby 5108 R. Rivard 5117 J. Hand 5231 S. *Rogers* 5230 R. Garton 5230 S. Carnahan 5230
M. MacConnel 5117 J. Cleveland 5224

FORM INTEC-5436 (10/27/00)
REV. 6

UTILITIES MONTHLY PRODUCTION & CONSUMPTION REPORT

This data sheet is the current revision date per the current Form Index:

Signature / Date

Month February 2003 Issue Date 3/12/2003

PRODUCED			CONSUMED		
Oil Produced Steam	18,388,058	lbs	Diesel	667	gal
Peak Steam Load	43,000	pph	Fuel Oil	155,831	gal
Compressed Air	59,713,920	cu ft.	Propane	3,462	gal
Potable Water		gal	Salt	70,880	lbs
Demineralized Water	17,770	gal	Electricity	3,885,600	kwh
Treated Water	25,108,000	gal	Sulfuric Acid	261	gal
Raw/Fire Water	**	gal	Sodium Hydroxide	0	gal
Sewage Plant Effluent	667,359	gal			

RECEIVED			ON HAND		
Diesel	1,180	gal	Diesel	10,903	gal
Fuel Oil	~~138,800~~ 128,600	gal	Fuel Oil	~~213,421~~ 203,421	gal
Propane	3,567	gal	Propane	3,205	gal
Salt	70,880	Lbs.			

BOILER	FUEL USED GALLONS
8-UTI-607	0
B-UTI-608	2,170
B-UTI-609	21,674
B-UTI-610	72,918
8-UTI-611	59,069
TOTAL	155,831 Gallons ÷ 28 Days = 5,565 Fuel consumed daily

NOTE: Total fuel consumed must not exceed 29.976 gallons a day per Air Permit PTC-#023-00001.

*Potable water flow meter out of service **Raw water totalizer out of service

Distribution: K. Willoughby 5231 R. Rivard 5117 J. Hand 5231 S. Rogers 5230 R. Garton 5230 S. Carnahan 5230
M. MacConnel 5117 J. Cleveland 5224 Ernest L Fossum Mary K Wall

FORM INTEC-5436 (10/25/01)
REV. 7
Page 1 of 1

UTILITIES MONTHLY PRODUCTION AND CONSUMPTION REPORT

This data sheet is the current revision date per the current Form Index:

Signature / Date

Month March 2003 | Issue Date 4/14/2003

PRODUCED			CONSUMED		
Oil Produced Steam	14,053,800	lbs	Diesel	626	gal
Peak Steam Load	32.000	pph	Fuel Oil	119,100	gal
Compressed Air	65,102,400	cu ft	Propane	3,872	gal
Potable Water		gal	Salt	70,300	lbs
Demineralized Water	60.100	gal	Electricity	3,836,300	kwh
Treated Water	18,638,000	gal	Sulfuric Acid	332	gal
Raw/Fire Water	11,607,000	gal			
Sewage Plant Effluent	418.382	gal			

RECEIVED			ON HAND		
Diesel	225	gal	Diesel	10,502	gal
Fuel Oil	108,115	gal	Fuel Oil	196,122	gal
Propane	3,567	gal	Propane	2.900	gal
Salt	70,300	lbs			

BOILER		FUEL USED GALLONS				
B-UTI-607		0				
B-UTI-608		28,612				
8-UTI-609		63.246				
8-UTI-610		27,242				
B-UTI-611	TOTAL	119.160	+	30	-	3.970
		Gallons		Days		Fuel consumed daily

NOTE: *Total bel consumed must not exceed 25,920 gallons a day per Air Permit PTC-#023-00001.*

• meter out of *service*

Distribution: K. Willoughby 5106, R. Rivard 5117, J. Hend 5231, S. Rogers 5230, R.Garton 5230, S. Camahan 5230
M. MacConnel 5117, J. Cleveland 5224. E.Fossum 3760, M. Nell 3750. J. Pyle 5117

FORM INTEC-5436 (10/25/01)
REV. 7
Page 1 of 1

UTILITIES MONTHLY PRODUCTION AND CONSUMPTION REPORT

This data sheet is the current revision data per the current Form Index

Signature / Date

Month April 2003 Issue Date 5/12/2003

PRODUCED			CONSUMED		
Oil Produced Seam	11,185,220	lbs	Diesel	345	gal
Peak Steam Load	20,000	pph	Fuel Oil	94.790	gal
Compressed Air	64.065.600	cu ft	Propane	3,573	gal
Potable Water	1,637,318*	gal	Salt	0	lbs
DemineralizedWater	16.050	gal	Electricity	3,642,700	kwh
Treated Water	18.863.000	gal	Sulfuric Acid	478	gal
Raw/Fire Water	**	gal			
Sewage Plant Effluent	176,622	gal			

RECEIVED			ON HAND		
Diesel	137	gal	Diesel	10,294	gal
Fuel Oil	60,000	gal	Fuel Oil	161,332	gal
Propane	3.975	gal	Propane	3,302	gal
Salt	0	lbs			

BOILER		FUEL USED GALLONS				
B-UTI-607		0				
8-UTI408		86.880				
B-UTI-609		7,910				
&UTI-610		0				
B-UTI-611	TOTAL	94,790	÷	30	=	3,160
		Gallons		Days		Fuel consumed daily

NOTE: *Total fuel consumed must not exceed 25,920 gallons a day per Air Permit PTC-#023-00001.*

'An actual reading of 927,814 gal was recorded from 4/13/03 until 4/30/03. An average of 54,577a day times 30 days equal 1,637,310 total gallons.
** raw water totalizer *out* of service.

Distribution: K. Willoughby 5106, R. Rivard 5117, J. Hand 5231. S. Rogers 5230. R.Garton 5230, S. Carnahan 5230 M. MacConnel 5117. J. Cleveland 5224, E.Fossum 3760, M. Nell 3750, J. Pyle 5117

FORM INTEC-5436 (10/25/01)
RN.7
Page 1 of 1

UTILITIES MONTHLY PRODUCTION AND CONSUMPTION REPORT

This data sheet is the current revision date per the current Form Index

Signature / Date

Month May 2003 Issue Date 6/19/03

PRODUCED			CONSUMED		
Oil Produced Steam	11,510,074	lbs	Diesel	344	gal
Peak Steam Load	26,000	pph	Fuel Oil	97.543	gal
Compressed Air	69,995,520	cu ft	Propane	2,094	gal
Potable Water	1,154,155	gal	Salt	70.500	lbs
Demineralized Water	25,340	gal	Electricity	3,702,700	kwh
Treated Water	30,447,000	gal	Sulfuric Acid	355	gal
Raw/Fire Water	15.378,000	gal			
Sewage Plant Effluent	153,598	gal			

RECEIVED			ON HAND		
Diesel	53	gal	Diesel	9,973	gal
Fuel Oil	84.300	gal	Fuel Oil	148,089	gal
Propane	2.243	gal	Propane	3,451	gal
Salt	70,500	lbs			

BOILER		FUEL USED GALLONS				
B-UTI-607		0				
B-UTI-608		14.745				
8-UTI-609		80,449				
B-UTI-610		0				
B-UTI-611	TOTAL	2,3491 97,543	+	31	=	3.146
		Gallons		Days		Fuel consumed daily

NOTE: *Total fuel consumed must not exceed 25,920 gallons a day per Air Permit PTC-#023-00001.*

Distribution: K. Willoughby 5106, R. Rivard 5117, J. Hand 5231, R.Garton 5230. S. Camahan 5230
M. MacConnel 5117, J. Cleveland 5224. E.Fossum 3760. M. Nell 3750, J. Pyle 5117

FORM INTEC-5436 (10/25/01)
REV. 7
Page 1 of 1

UTILITIES MONTHLY PRODUCTION AND CONSUMPTION REPORT

This data sheet is the current revision date per the current Form Index

Signature Date

Month June 2003

Issue Date 7/17/03

PRODUCED		
Oil Produced Steam	9,099,452	lbs
Peak Steam Load	22,800	pph
Compressed Air	65,275,200	cu ft
Potable Water	706,672	gal
Demineralized Water	32,420	gal
Treated Water	30,584,000	gal
Raw/Fire Water	15,648,000	gal
Sewage Plant Effluent	479,263	gal

CONSUMED		
Diesel	474	gal
Fuel Oil	77,114	gal
Propane	762	gal
Salt	70,920	lbs
Electricity	3,260,500	kwh
Sulfuric Acid	453	gal

RECEIVED		
Diesel	240	gal
Fuel Oil	60,003	gal
Propane	490	gal
Salt	70.920	lbs

ON HAND		
Diesel	9,739	gal
Fuel Oil	130,978	gal
Propane	3,179	gal

BOILER	FUEL USED GALLONS
E-UTI-607	0
E-UTI-608	3,829
B-UTI-609	73,285
B-UTI-610	0
E-UTI-611	

TOTAL 77,114 Gallons + 30 Days = 2,570 Fuel consumed daily

NOTE: ***Total fuel consumed must not exceed 25,920 gallons a day per Air Permit PTC-#023-00001.***

Distribution: K. Willoughby 5106. R. Rivard 5117, J. Hand 5231, S. Rogers 5230, R. Garton 5230, S. Carnahan 5230
M. MacConnel 5117, J. Cleveland 5224, E. Fossum 3760, M. Nell 3750, J. Pyle 5117

FORM INTEC-5436 (10/25/01)
REV. 7
Page 1 of

UTILITIES MONTHLY PRODUCTION AND CONSUMPTION REPORT

This data sheet is the current revision date per the current Form Index:

Signature / Date

Month July 2003

Issue Date 8/18/2003

PRODUCED		
Oil Produced Steam	7,990,370	lbs
Peak Steam Load	23,000	pph
Compressed Air	63,790,560	cu ft
Potable Water	903,583	gal
Demineralized Water	46,510	gal
Treated Water	30,584,000	gal
Raw/Fire Water	2,799,000	gal
Sewage Plant Effluent	562,823	gal

CONSUMED		
Diesel	2,375	gal
Fuel Oil	67,715	gal
Propane	440	gal
Salt	69,160	lbs
Electricity	3,833,200	kwh
Sulfuric Acid	443	gal

RECEIVED		
Diesel	119	gal
Fuel Oil	78,710	gal
Propane	603	gal
Salt	69.160	lbs

ON HAND		
Diesel	7,483	gal
Fuel Oil	141,973	gal
Propane	3,342	gal

BOILER		FUEL USED GALLONS				
B-UTI-607						
B-UTI-608		296				
8-UTI-609		67,179				
B-UTI-610		240				
B-UTI-611	TOTAL	67.715	+	31	-	2,184
		Gallons		Days		Fuel consumed daily

NOTE: ***Total fuel consumed must not exceed 25,920 gallons a day per Air Permit PTC-#023-00001.***

Distribution: K. Willoughby 5106. R. Rivard 5117, J. Hand 5231. R. Garton 5230, M. MacConnel 5117, J. Cleveland 5224, E. Fossum 3760, M. Nell 3750, J. Pyle 5117

FORM-36
Rev. 0
06/29/00

INTEC SEWAGE TREATMENT PLANT
FLOW TOTALIZER READINGS

MONTH/YEAR November 2002

FINAL INFLUENT TOTALIZER READING FROM PREVIOUS MONTH 2088127
FINAL EFFLUENT TOTALIZER READING FROM PREVIOUS MONTH 58032297

DAY	TIME	INFLUENT TOTALIZER READING	DAILY INFLUENT (GAL)	EFFLUENT TOTALIZER READING	DAILY EFFLUENT (GAL)	OPERATORS INITIALS
1						
2	0900	2153831	65704	58072204	39907	RE
3	1232	2195391	41560	58092624	20420	AM
4	8:56	2237115	41,724	58113792	21,168	GH
5	8:29	2286527	49,412	58142019	28,227	GH
6	9:25	2338284	51,757	58185230	43,211	GH
7	9:15	2395029	56,745	58218617	33,387	GH
8	10.35	2448159	53,130	58267103	48,486	KBT
9	950	2474154	25995	58282493	15,390	RE
10	1045	2501328	27174 ~~20215~~	58302708	20215	KDT
11	8:51	2536214	34,886	58314518	11,810	GH
12	9:03	2591418	55,204	58345615	31,097	GH
13	9:00	2645451	54,033	58378037	32,422	GH
14	8:57	2698618	53,167	58408919	30,882	GH
15	~~1017~~	~~2753191~~ JT 11-15-02	~~69523~~	~~58954122~~	~~45,203~~	~~JT~~
~~16~~ 15	1017	2752141	53523	58454122	45203	JT
~~17~~ ~~16~~	~~1245~~	~~2794156~~	~~42015~~	~~58493555~~	~~39433~~	~~RE~~
~~18~~ RE 11-17-02 17	1040	2830414	36258	58525418	31863	RE
~~19~~ 18	8:43	2867955	37,541	58555389	29,971	GH
~~20~~ 19	9:50	2923952	55,997	58599496	44,107	GH
~~21~~ 20	9:28	2976722	52,770	58643971	44,475	GH
21	8:55	3030028	53,306	58687679	43,708	GH

FORM-36
Rev. 0
06/29/00

DAY	TIME	INFLUENT TOTALIZER READING	DAILY INFLUENT (GAL)	EFFLUENT TOTALIZER READING	DAILY EFFLUENT (GAL)	OPERATORS INITIALS
22	1100	3125836	45208	58737252	48583	[illegible]
23	1010	3167026	41790	58772155	34903	DC
24	1015	3163596	3430	58811164	39009	KDJ
25	9:25	3203823	40,227	58842359	31,195	MB
26	9:15	3261470	57,647	58882773	40,414	GH
27	9:46	3315843	54,373	58923036	40,263	RB
28	10:30	3366252	50409	58964351	41315	DH
29	1055	3407974	41722	58996983	32632	JT
30	0910 ~~10 1840~~	3446725	38751	59026589	29606	GB
31						

I/P #1	I/P #2	I/P #3	I/P #4	NORTH ←

COMMENTS SECTION:

Nov 1st flow wasn't taken. So we divided Nov 2nd flow by two. Nov 1st influent flow is 32,852 Effluent flow is 19,954
Nov 2nd influent flow is 32,852 and Effluent flow is 19,954. G. Holden 11-4-02
south influent 005

*LIST ANY ABNORMAL CONDITIONS

ABNORMAL CONDITIONS: HIGH FLOW RATE ABOVE 80,000 GPD
EQUIPMENT FALURE
EQUIPMENT OUT OF SERVICE FOR REPAIR OR CALIBRATION
ABNORMAL WEATHER CONDITIONS

effluent
59026589
58032297
994292

Influent
3446725
2088127
1358598
994292
364306

U6287GPD Influent

INTEC SEWAGE TREATMENT PLANT
FLOW TOTALIZER READINGS

MONTH/YEAR Dec /02

FINAL INFLUENT TOTALIZER READING FROM PREVIOUS MONTH. 3446725

FINAL EFFLUENT TOTALIZER READING FROM PREVIOUS MONTH. 59026589

DAY	TIME	INFLUENT TOTALIZER READING	DAILY INFLUENT (GAL)	EFFLUENT TOTALIZER READING	DAILY EFFLUENT (GAL)	OPERATORS INITIALS
1	1030	3490808	44083	59059505	32916	JT
2	9:43	3533435	42,627	59089262	29,757	GH
3	9:12	3588164	54,729	59127188	37,926	LMB
4	8:55	3644034	55,870	59167740	40,552	LMB
5	9:30	3706741	62,707	59212500	44,760	LMB
6	12:30	3764856	58,115	99260682	48,182	PA
7	1020	3800121	35265	59287483	26801	DC
8	1030	3842189	41068	59320155	32672	GB
9	9:36	3883048	40,859	59350078	29,923	GH
10	9:16	3942943	59,895	59392373	42,295	GH
11	9:33	3997909	54,966	59436621	44,248	GH
12 GH 12-12-02	9:23	4055823 ~~005~~	77,914 ~~005~~	59479718	43,097	GH
13	1015	~~005~~	005	59523589	43871	RE
14	1125	~~4053823~~ JT ~~005~~ 4130024	74201 JT ~~005~~ JT	59562713	38724	JT
15 GH 12-16-02	1025	4150712 ~~[illegible]~~	20,688 ~~[illegible]~~	59596677	34,364	GB
16	9:51	4179110	28,398	59627626	30,949	GH
17	9:30	4231577	52,467	59673935	46,309	GH
18	9:43	4282233	50,656	59712567	38,632	GH
19	9:21	4327957	45,724	59747797	35,230	GH
20	1160	4370880	42,923	59781533	33,736	BL
21	1025	4407072	36192	59807690	26157	RE

with storm off abled

MD

MO

from 12th on are accurate for North Instrument → estimate South

19th readings on TB lift station taken at daily 9am increments

DAY	TIME	INFLUENT TOTALIZER READING	DAILY INFLUENT (GAL)	EFFLUENT TOTALIZER READING	DAILY EFFLUENT (GAL)	OPERATORS INITIALS
22	~~1210~~	~~4436737~~	~~29665~~	~~59834232~~	~~26542~~	[illegible]
23	9:26	4463032	26,295	59856222	21,990	JH
24	9:37	4507923	44,891	59884995	28773	RB
25	~~0530~~	~~4537398~~	~~29475~~	~~59908527~~	~~23532~~	[illegible]
26	10:55	4568818	31420	59933256	24729	~~SH~~
27	1002	4594289	25471	59958793	25537	KDJ
28	1015	4620413	26124	59986696	27903	KDJ
29	1100	4647284	26871	60013274	26578	RE
30	1045	4673384	26,100	60037890	24616	SA
31	0835	4695748	22364	60058690	20800	JT

I/P #1	I/P #2	I/P #3	I/P #4	NORTH ←

COMMENTS SECTION:

12/3/02 - turned off blower MS-40F-201 - will switch blowers weekly. MD to avoid blower damage through Winter

South effluent OOS

12-16-02 - changed 12-15-02 influent flow reading because of error in addition. JH

*LIST ANY ABNORMAL CONDITIONS

ABNORMAL CONDITIONS: HIGH FLOW RATE ABOVE 80,000 GPD

EQUIPMENT FALURE

EQUIPMENT OUT OF SERVICE FOR REPAIR OR CALIBRATION

ABNORMAL WEATHER CONDITIONS

Influent
4,695,748
3,446,725
1,249,023

Average 40,291

effluent
60,058,690
59,026,589
1,032,101

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INTEC SEWAGE TREATMENT P U N T
. FLOW TOTALIZER READINGS

MONTH/YEAR Jan 2003

FINAL INFLUENT TOTALIZER READING FROM PREVIOUS MONTH. 4695748

FINAL EFFLUENT TOTALIZER READING FROM PREVIOUS MONTH. 60058690

DAY	TIME	INFLUENT TOTALIZER READING	DAILY INFLUENT (GAL)	EFFLUENT TOTALIZER READING	DAILY EFFLUENT (GAL)	OPERATORS INITIALS
1	0820	4722930	27182	60085305	26615	JB
2	10:05	4752966	30,036	60110025	24,720	MR
3	1100	4785275	32309	60136923	26 898	RJ
4	0805	4809923	24648	60157377	20 454	RE
5	1120	4847881	32959	60183818	26421	RJ
6	9:43	4873073	30,192	60205754	21,938	GH
7	10:10	4926213	53,140	60243027	37,271	GH
8	9:35	4976102	49 889	60281128	38,101	GH
9	9:10	5024670	48,568	60321021	39,893	GH
10	0835	5066095	41425	60356693	35672	Bu
11	10:25	5095395	29300	60386792	30 099	KDJ
12	0815	5119871	24476	60402451	15659	RE
13	9:06	5151438	21,567	60419099	16,648	GH
14	9:40	5198671	47,233	60445279	26,180	GH
15	9:38	5243664	44,993	60475023	29,744	GH
16	10:16	5293606	49,942	60504276	29,253	GH
17	0800	5338903	45,297	60528476	24,200	JT
18	0830	5357009	18106	60543204	24732	JB
19	1020	5385271	28262	60557159	13955	MM
20	9:18	5414709	29,438	60572386	15,227	GH
21	9:24	5462416	47,707	60597742	25,356	GH

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DAY	TIME	INFLUENT TOTALIZER READING	DAILY INFLUENT (GAL)	EFFLUENT TOTALIZER READING	DAILY EFFLUENT (GAL)	OPERATORS INITIALS
22	9:13	5503385	40,869	60627074	29,332	JH
23	9:44	5546357	42,972	60652299	25,225	JH
24	1005	5585046	38689	60680471	28182	[illegible]
25	0816	5613210	28164	60601176	19705	[illegible]
26	1030	5653373	40163	60723082	21,906	[illegible]
27	9:40	5692540	39,167	60746361	23,279	JH
28	9:38	5736923	44,383	60781198	34,837	JH
29	9:15	5777033	40,110	60808729	27,531	JH
30	9:36	5823971	46,938	60837399	28,660	RB
31	9:25	5860829	36,858	60863751	26,362	CH

I/P #1	I/P #2	I/P #3	I/P #4	NORTH ←

COMMENTS SECTION:

1-2 switched to blower MS-YOF-202
South channel OOS

*LIST ANY ABNORMAL CONDITIONS
ABNORMAL CONDITIONS: HIGH FLOW RATE ABOVE 80,000 GPD
EQUIPMENT FALURE
EQUIPMENT OUT OF SERVICE FOR REPAIR OR CALIBRATION
ABNORMAL WEATHER CONDITIONS

5860629
4695748
Influent 1,165,081

60863751
60058690
805061 effluent

Influent average 37,583

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INTEC SEWAGE TREATMENT PLANT
FLOW TOTALIZER READINGS

MONTH/YEAR FEB. 2003

FINAL INFLUENT TOTALIZER READING FROM PREVIOUS MONTH 5860829
FINAL EFFLUENT TOTALIZER READING FROM PREVIOUS MONTH 6086375I

DAY	TIME	INFLUENT TOTALIZER READING	DAILY INFLUENT (GAL)	EFFLUENT TOTALIZER READING	DAILY EFFLUENT (GAL)	OPERATORS INITIALS
1 2/1	1000	5894618	33,789	60887416	23,665	CA
2 2/2	0900	5924129	29,511	60909308	21,892	CH
3	0900	5955230	31,101	60926314	17006	mB
4	9:03	5999594	44,364	60952678	26,364	gH
5	8:55	6042608	43,014	60978429	25,751	gH
6	9:30	6093095	50,497	61006732	28,303	gH
7	1115	6134223 ~~[illegible]~~	44,128	61034337	27605	[illegible]
8	0900	6158281	24058	61049726	15,389	CA
9 gH 2-10-03	1030	~~6211502~~ 6266784	33,221 ~~33,221~~	61069550	19,824	DC
10 gH 2-10-03	9:09	6191502 6221680	30,178 ~~10,178~~	61088222	18,672	gH
11	9:45	6265112	43432	61116838	28,616	gH
12	9:25	6326339	61,227	61145682	28,844	gH
13	9:00	6388483	62,144	61174584	28,902	MB
14	1043	JT 2-14-03 ~~65~~ 6448604	60121	61211217	36633	JT
15	1030	6496398	47794	61238345	27128	DC
16	1014	6540290	43,892	61260677	22,332	JT
17	9:35	6589529	49,239	61286933	26,256	gH
18	9:44	6649845	60,316	61317400	30,467	gH
19	9:13	6702814	52,969	61342782	25,382	gH
20	9:38	6759768	56,954	61369230	26,448	gH
21	1100	6815651	55,883	61395968	26,738	[illegible]

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DAY	TIME	INFLUENT TOTALIZER READING	DAILY INFLUENT (GAL)	EFFLUENT TOTALIZER READING	DAILY EFFLUENT (GAL)	OPERATORS INITIALS
22	10:30	6855200	39549	61415007	19,039	DH
23	1055	6891163	40963	61431702	16705	[illegible]
24	9:02	6924290	28,129	6144266	10,949	GH
25	9:45	6985288	60,996	6146531	22,653	GH
26	8:45	7029821	44533	61487028	21,714	MJ
27	9:30	7078858	49,037	61508862	21,834	mk
28	10:20	7124519	45661	61531110	22248	DH
29 MO 3-3-03	~~10:25~~	~~7155750~~	~~31,231~~	~~61545669~~	~~14549~~	~~KDJ~~
30	~~10:05~~	~~7185804~~	~~30054~~	~~61558003~~	~~12344~~	~~KDJ~~
31						

I/P #1	I/P #2	I/P #3	I/P #4	NORTH ←

COMMENTS SECTION:

2-3-03 - switched to blower 201
2-10-03 - found error in influent subtraction on 2-9-03 from scratch paper left behind. I then corrected it and changed the flows. -G.H.
2-18-03 - Turned both Blowers on.
South instrument OOS til 2/14/03

*LIST ANY ABNORMAL CONDITIONS
ABNORMAL CONDITIONS: HIGH FLOW RATE ABOVE 30,000 GPD
EQUIPMENT FALURE
EQUIPMENT OUT OF SERVICE FOR REPAIR OR CALIBRATION
ABNORMAL WEATHER CONDITIONS

Influent
7124519
5860829
1,263690

Effluent
61531110
60863751
667359

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INTEC SEWAGE TREATMENT PLANT
FLOW TOTALIZER READINGS

MONTH/YEAR March 2003

FINAL INFLUENT TOTALIZER READING FROM PREVIOUS MONTH. 7124519
FINAL EFFLUENT TOTALIZER READING FROM PREVIOUS MONTH. 61531110

DAY	TIME	INFLUENT TOTALIZER READING	DAILY INFLUENT (GAL)	EFFLUENT TOTALIZER READING	DAILY EFFLUENT (GAL)	OPERATORS INITIALS
1	10:25	7155750	31,231	61545659	14,549	GH
2	10:05	7185804	30,054	61558003	12,344	GH
3	9:27	7218290	32,486	61570673	12,670	GH
4	9:20	7271402	53,112	61592346	21,673	MG
5	9:24	7319420	48,018	61615559	23,213	GH
6	9:25	7366754	47,334	61637441	21,882	GH
7	0830	7408615	41861	61657141	19700	[illegible]
8	1140	7443599	34984	61673567	16363	[illegible]
9	0830	7470713	27114	61684436	10931	AM
10	8:32	7503821	33,108	61698964	14,528	GH
11	9:26	7559877	56,056	61722326	23,362	GH
12	9:40	7608296	48,419	61744002	21,676	GH
13	9:45	7657001	48,705	61764843	20,841	GH
14	10:00	7704542	47541	61785747	20 904	DC
15	10 15	7749669	45127	61802506	16759	DC
16	10:05	7793226	43557	61819521	17015	KDJ
17	8:45	7836723	43,497	61825041	5,520	MG
18	9:30	7898223	61,500	61836826	11,785	GH
19	9:05	7953353	55,130	61847373	10,547	GH
20	8:52	8012647	59,294	61860916	13,543	GH
21	10:15	8071358	58 711	61875031	14 115	DH

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DAY	TIME	INFLUENT TOTALIZER READING	DAILY INFLUENT (GAL)	EFFLUENT TOTALIZER READING	DAILY EFFLUENT (GAL)	OPERATORS INITIALS
22	0816	8114237	42879	61880467	5436	JT
23	1015	8168667	54430	61890500	10033 ~~10,[illegible]~~	[illegible]
24	8:40	8218073	49,406	61895302	4,802	MG
25	10:23	8281000	62,927	61908562	13,260	JH
26	9:00	8335626	54,626	61921286	12,724	MG
27	8:34	8392456	56,830	61933133	11,847	JH
28	1040	8454615	62159	61946100	12967	JB
29	1000	8500482	45867	61948400	2300	[illegible]
30	1030	8545229	44,747	61948728	328	SA
31	9:35	8590162	44,933	61949392	664	JH

I/P #1	I/P #2	I/P #3	I/P #4	NORTH ←

COMMENTS SECTION:

*LIST ANY ABNORMAL CONDITIONS
ABNORMAL CONDITIONS: HIGH FLOW RATE ABOVE 80,000 GPD
EQUIPMENT FALURE
EQUIPMENT OUT OF SERVICE FOR REPAIR OR CALIBRATION
ABNORMAL WEATHER CONDITIONS

Influent
8590162
7,124,519
1,466,643

Effluent
61949392
61531110
418382

Difference
1,466,643
418,382
1,048,261

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INTEC SEWAGE TREATMENT PLANT
FLOW TOTALIZER READINGS

MONTH/YEAR April 2003

FINAL INFLUENT TOTALIZER READING FROM PREVIOUS MONTH. 8590162
FINAL EFFLUENT TOTALIZER READING FROM PREVIOUS MONTH. 61949392

DAY	TIME	INFLUENT TOTALIZER READING	DAILY INFLUENT (GAL)	EFFLUENT TOTALIZER READING	DAILY EFFLUENT (GAL)	OPERATORS INITIALS
1	9:01	8646266	56,104	61957092	7,700	JH
2	9:17	8705211	58,945	61970993	13,901	JH
3	9:25	8763024	57,813	61983824	12,831	JH
4	10:15	8820361	57,337	61992864	9040	DC
5	1030	8862044	41683	61995385	2521	JB
6	1040	8903606	41562	61996157	772	JB
7	8:30	8944461	40,855	61996990	833	JH
8	8:43	8995677	51,216	62004210	7,220	JH
9	9:01	9046080	50,403	62012449	8,239	JH
10	9:09	9094854	48,774	62020792	8,343	
11	1030	A.	A.	62027171	6,379	RE
12	1115	A	A	62027906	735 ~~535~~	RA
13	1030	A	A	62027990	84	DC
14	9:05	A	A	62021996	769	JH
15	8:50	41988	52,866	62041941	18,951	JH
16	9:13	89269	47,281	62060769	18,828	JH
17	8:31	132051	42,782	62070230	9,461	JH
18	10:25	177294	45,243	62081134	10,904	MJ
19	9:48	208900	31,606	62082911	1777	SH
20	0900	234942	26042	62083125	214 MG 4-21-03 ~~2711~~	RE
21	9:14	266969	32,027	62083143	18	JH

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DAY	TIME	INFLUENT TOTALIZER READING	DAILY INFLUENT (GAL)	EFFLUENT TOTALIZER READING	DAILY EFFLUENT (GAL)	OPERATORS INITIALS
22	8:52	297216	30,247	62084272	B 1,129	GH
23	8:56	21991	C	62088039	B 3,767	GH
24	9:04	55077	33,086	62100955	12,916	GH
25	10:30	83845	38768	62103598	B 2643	DH
26	0905	98084	14239	62104063	B 465	RE
27	0955	113194	15110	62104140	B 77	RE
28	9:53	130438	17,244	62104140	B 0	GH
29	9:10	163037	32,599	62115360	11,220	GH
30	8:54	199513	36,476	62126014	10,654	GH
31						

I/P #1	I/P #2	I/P #3	I/P #4	NORTH ←

COMMENTS SECTION:

A. Loss of logs - due to power loss on 4/10/03 at 1645 hrs. G. Beck has been notified.

4-21-03 - corrected effluent flow for 4-20-03

B 4-22-03 - lost valve ~~SGF-YDF~~ MG 4-23-03 plug on ~~SG-YDF-773~~ MG 4-23-03 SG-YDF-773-S

C - Back-up battery was replaced changing numbers - will substract 4-24-03

*LIST ANY ABNORMAL CONDITIONS
ABNORMAL CONDITIONS: HIGH FLOW RATE ABOVE 80,000 GPD
EQUIPMENT FALURE
EQUIPMENT OUT OF SERVICE FOR REPAIR OR CALIBRATION
ABNORMAL WEATHER CONDITIONS

Influent

199513
297216
496,729

9,094,854
8,590,162
584,692
+496,729

Effluent 62,126,014
61,949,372
176,622

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INTEC SEWAGE TREATMENT PLANT
FLOW TOTALIZER READINGS

MONTH/YEAR May 2003

FINAL INFLUENT TOTALIZER READING FROM PREVIOUS MONTH. 199513
FINAL EFFLUENT TOTALIZER READING FROM PREVIOUS MONTH. 62126014

DAY	TIME	INFLUENT TOTALIZER READING	DAILY INFLUENT (GAL)	EFFLUENT TOTALIZER READING	DAILY EFFLUENT (GAL)	OPERATORS INITIALS
1 9:15		232829	33,316	62129865	3,851	GH
2	0955	262335	29506	62132741	2876	[illegible]
3 5-3-03	10.05	279136	16801	62155091	22350	KDJ
4 5-4-03	0905	293215	14074	62156774	1683	KDJ
5	8:37	309252	94 5-6-03 ~~16937~~	62156774	0	GH
6	9:17	343313	16,037 34,061	62160527	3,753	GH
7	9:24	381077	37,764	62164616	4,089	GH
8	9:07	412152	31,075	62165874	1,258	GH
9 5-9-03	8:40	455214	43062	62166523 ~~62165523~~	MO 5-12-03 ~~2649~~ 649	PS
10	740	482941	27127	62166554	MO 5-12-03 ~~1161~~ 31	JT
11	1000	517044	34103	62166554	0	[illegible]
12	9:11	549606	32,562	62166711	157	GH
13	8:05	590062	40,456	62167548	837	GH
14	9:07	642924	52,862	62169331	1,783	GH
15	9:25	688132	45,208	62170717	1,386	GH
16	9:55	729547	61,415	62171515	798	RE
17	830	758470	28923	62174415	2900	[illegible]
18	1045	790650	32185	62184022	8607	SA
19	09:10	820912	30262	62185874 ~~62184[illegible]~~ 5-20-03 RE	1852	RE
20	1347	876212	5 55300	62197353	11479	[illegible]
21	9:20	906598	30386	62197422	69	DH

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DAY	TIME	INFLUENT TOTALIZER READING	DAILY INFLUENT (GAL)	EFFLUENT TOTALIZER READING	DAILY EFFLUENT (GAL)	OPERATORS INITIALS
22	8:50	943677	39,079	62210590	13,168	MG
23	11:35	967321	~~23,644~~	62222002	12,412	SA
24	1020	951946	15,375	62221182	3980	JB
25	9:00	981280	29,334	62226793	611	SA
26	7:50	1069692	88,412	62229463	~~3,000~~ 2,670	JT
27	9:30	1103354	33,762	62230130	667	JH
28	8:45	1149303	45,949	62236189	6,059	JH
29	9:10	1202794	53,491	62255993	53,491	JH
30	0950	1244581	41,787	62274641	19,804 18,648	JB
31	0845	1273889	29308	62279612	4971	D

I/P #1	I/P #2	I/P #3	I/P #4	NORTH ←

COMMENTS SECTION:

5-12-03 - Corrected flow for 5/9 + 5/10 M. Gray
A - notified supervision.

5-24-03 flows were taken incorrectly, causing 5/26 + 5/27/03 flows to be incorrect. I reported zero flow for influent

*LIST ANY ABNORMAL CONDITIONS
ABNORMAL CONDITIONS: HIGH FLOW RATE ABOVE 80,000 GPD
EQUIPMENT FAILURE
EQUIPMENT OUT OF SERVICE FOR REPAIR OR CALIBRATION
ABNORMAL WEATHER CONDITIONS

Influent
1273889
199513
Total 1074,376

Effluent
62,279,612
62,126,014
153,598

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INTEC SEWAGE TREATMENT PLANT
FLOW TOTALIZER READINGS

MONTH/YEAR June 2003

FINAL INFLUENT TOTALIZER READING FROM PREVIOUS MONTH 1273889
FINAL EFFLUENT TOTALIZER READING FROM PREVIOUS MONTH 62279612

DAY	TIME	INFLUENT TOTALIZER READING	DAILY INFLUENT (GAL)	EFFLUENT TOTALIZER READING	DAILY EFFLUENT (GAL)	OPERATORS INITIALS
1	0940	1304495	30606	62282006	3394	SA
2	9:00	1334572	30,077	62285635	3,629	GH
3	9:05	1381322	46,750	62298686	13,051	YMG
4	8:43	1432217	50,895	62321223	22,537	GH
5	8:55	1478004	45,787	62339926	18,703	GH
6	10:30	1525226	47,222	62364175	24,249	KDJ
7	08:40	1553725	28,499	62372059	7902	KDJ
8	0900	1584268	~~73~~ 30541	62377990	5931	JB
9	9:02	1616827	32,559	62386562	8,572	GH
10	9:01	1666774	49,947	62403136	16,574	GH
11	8:55	1720676	53,902	62421046	17,910	GH
12	9:10	1774396	53,720	62441293	20,247	YMG
13	0900	1833571	59175	62473497	32,204	AJM
14	0930	1867083	33,512	62483089	11,592	RE
15	0845	1897743	30660	62490290	5201	RE
16	8:55	1936389	38,646	62501038	10,738	GH
17	8:54	1995265	58,876	62525303	24,265	GH
18	8:58	2064130	68,865	62549761	24,458	GH
19	9:28	2143869	79,739	62572617	22,856	GH
20	10:10	2214798	70,929	62592434	19817	KDJ
21	10:00	2267225	52427	62597929	5495	KDJ

JUL.17.2003 9:15AM CPP UTILITIES NO.309 P.2

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DAY	TIME	INFLUENT TOTALIZER READING	DAILY INFLUENT (GAL)	EFFLUENT TOTALIZER READING	DAILY EFFLUENT (GAL)	OPERATORS INITIALS
22	10:35	2323532	56307	62600482	2553	KDJ
23	8:32	2371300	47,768	62604910	4,428	[illegible]
24	9:11	2436020	64,720	62635988	31,078	[illegible]
25	9:24	2486585	50,565	62666417	30,429	[illegible]
26	9:17	2535526	48,941	62698416	31,999	[illegible]
27	7:40	2577638	42,112	62723966	25,550	JT
28	0905	2617902	40264	62738410	14,444	RE
29	0920	2656471	38569	62749534	11124	[illegible]
30	8:22	2690210	33,739	62758875	9,341	[illegible]
31						

I/P #1	I/P #2	I/P #3	I/P #4	NORTH ←

COMMENTS SECTION:

*LIST ANY ABNORMAL CONDITIONS
ABNORMAL CONDITIONS: HIGH FLOW RATE ABOVE 80,000 GPD
EQUIPMENT FALURE
EQUIPMENT OUT OF SERVICE FOR REPAIR OR CALIBRATION
ABNORMAL WEATHER CONDITIONS

Influent
2690210
1273889
1,416,321

Effluent
62758875
62279612
479,263

Appendix C

Existing Idaho Nuclear Technology and Engineering Center Percolation Ponds Daily Effluent Flow Readings and Electronic Data Files

Table C-1. Existing Idaho Nuclear Technology and Engineering Center percolation ponds daily effluent flows.

Date	Effluent (WW-013001) CPP-797 (gpd[a])	Date	Effluent (WW-013001) CPP-797
11/1/2001	1,432,200	11/25/2001	1,575,800
11/2/2001	1,338,700	11/26/2001	1,591,800
11/3/2001	1,326,000	11/27/2001	1,327,900
11/4/2001	1,349,600	11/28/2001	1,300,600
11/5/2001	1,310,100	11/29/2001	1,248,900
11/6/2001	1,355,800	11/30/2001	1,383,900
11/7/2001	1,317,700	12/1/2001	1,539,300
11/8/2001	1,332,800	12/2/2001	1,572,500
11/9/2001	1,465,600	12/3/2001	1,769,100
11/10/2001	1,738,500	12/4/2001	1,667,900
11/11/2001	1,814,600	12/5/2001	2,308,600
11/12/2001	1,650,900	12/6/2001	1,335,000
11/13/2001	1,424,400	12/7/2003	1,897,400
11/14/2001	1,401,100	12/8/2001	1,741,600
11/15/2001	1,186,900	12/9/2001	1,832,700
11/16/2001	1,313,400	12/10/2001	1,672,900
11/17/2001	1,316,200	22/11/2001	1,589,800
11/18/2001	1,241,100	12/12/2001	1,586,000
11/19/2001	1,216,100	12/13/2001	1,452,200
11/20/2001	1,252,300	12/14/2001	1,573,900
11/21/2001	1,381,000	12/15/2001	1,818,100
11/22/2001	1,489,900	12/16/2001	1,718,100
11/23/2001	1,674,000	12/17/2001	1,795,100
11/24/2001	1,545,000	12/18/2001	1,354,200

Table C-1. (continued).

Date	Effluent (WW-013001) CPP-797 (gpd[a])	Date	Effluent (WW-013001) CPP-797 (gpd[a])
12/19/2001	1,175,200	1/19/2002	1,500,600
12/20/2001	1,202,600	1/20/2002	1,480,100
12/21/201	1,342,300	1/21/2002	1,387,200
12/22/2001	1,634,600	1/22/2002	1,617,800
12/23/2001	1,705,100	1/23/2002	1,677,600
12/24/2001	1,383,300	1/24/2002	1,682,100
12/25/2001	1,377,000	1/25/2002	1,820,700
12/26/2001	1,325,900	1/26/2002	1,691,800
12/27/2001	1,532,300	1/27/2002	1,762,000
12/28/2001	1,431,600	1/28/2002	1,739,600
12/29/2001	1,449,100	1/29/2002	1,513,100
12/30/2001	1,585,600	1/30/2002	1,543,100
12/31/2001	1,447,600	1/31/2002	1,364,800
1/1/2002	1,334,400	2/1/2002	,429,800
1/2/2002	1,390,000	2/2/2002	,266,600
1/3/2002	1,520,800	2/3/2002	,155,400
1/4/2002	1,685,300	2/4/2002	,189,200
1/5/2002	1,803,800	2/5/2002	,249,200
1/6/2002	1,525,300	2/6/2002	1,415,300
1/7/2002	1,578,300	2/7/2002	1,304,600
1/8/2002	1,556,100	2/8/2002	1,286,300
1/9/2002	1,759,800	2/9/2002	1,373,100
1/10/2002	1,638,600	2/10/2002	1,257,300
1/11/2002	1,724,300	2/11/2002	1,251,300
1/12/2002	1,863,000	2/12/2002	1,279,200
1/13/2002	1,488,300	2/13/2002	1,453,900
1/14/2002	1,467,800	2/14/2002	1,479,000
1/15/2002	1,774,600	2/15/2002	1,353,800
1/16/2002	1,633,100	2/16/2002	1,365,700
1/17/2002	1,454,400	2/17/2002	1,583,700
1/18/2002	1,483,200	2/18/2002	1,608,800

Table C-1. (continued).

Date	Effluent (WW-013001) CPP-797 (gpd[a])	Date	Effluent (WW-013001) CPP-797 (gpd[a])
2/19/2002	1,420,300	3/22/2002	1,327,300
2/20/2002	1,371,600	3/23/2002	1,226,300
2f21/2002	1,377,000	3/24/2002	1,278,100
2/22/2002	1,397,600	3/25/2002	1,229,800
2/23/2002	1,315,400	3/24/2002	1,286,900
2/24/2002	1,376,100	3/27/2002	1,228,000
2/25/2002	1,362,200	3/28/2002	1,259,200
2/26/2002	1,374,000	3/29/2002	1,241,800
2/27/2002	1,391,200	3/30/2002	1,246,000
2/28/2002	1,361,300	3/31/2002	1,207,300
3/1/2002	1,343,500	4/1/2002	1,227,700
3/2/2002	1,373,000	4/2/2002	1,231,500
3/3/2002	1,395,300	4/3/2002	1,414,400
3/4/2002	1,330,900	4/4/2002	1,279,100
3/5/2002	1,384,600	4/5/2002	1,308,100
3/6/2002	1,332,500	4/4/2002	1,305,000
3/7/2002	1,286,700	4/7/2002	1,183,200
3/8/2002	1,298,900	4/8/2002	1,143,000
3/9/2002	1,413,000	4/9/2002	1,144,300
3/10/2002	1,467,000	4/10/2002	1,167,300
3/11/2002	1,352,000	4/11/2002	1,116,200
3/12/2002	1,387,900	4/12/2002	1,072,800
3/13/2002	1,401,700	4/13/2002	1,020,600
3/14/2002	1,297,300	4/14/2002	1,203,300
3/15/2002	1,422,100	4/15/2002	1,272,600
3/16/2002	1,483,500	4/16/2002	1,317,800
3/17/2002	1,423,200	4/17/2002	1,205,800
3/18/2002	1,451,800	4/18/2002	1,184,700
3/19/2002	1,350,200	4/19/2002	1,148,400
3/20/2002	1,372,300	4/20/2002	1,038,200
3/21/2002	1,356,600	4/21/2002	1,088,400

Table C-1. (continued).

Date	Effluent (WW-013001) CPP-797 (gpd[a])	Date	Effluent (WW-013001) CPP-797 (gpd[a])
4/22/2002	1,057,900	5/23/2002	1,037,700
4/23/2002	996,600	5/24/2002	978,100
4/24/2002	1,066,000	5/25/2002	990,700
4/25/2002	1,029,900	5/26/2002	1,066,000
4/26/2002	1,055,900	5/27/2002	1,074,700
4/27/2002	976,700	5/28/2002	1,075,600
4/28/2002	1,059,100	5/29/2002	1,052,400
4/29/2002	1,032,500	5/30/2002	1,142,800
4/30/2002	1,044,700	5/31/2002	1,305,300
5/1/2002	1,084,600	6/1/2002	1,230,100
5/2/2002	1,003,400	6/2/2002	1,166,300
5/3/2002	980,900	6/3/2002	1,139,800
5/4/2002	943,000	6/4/2002	1,360,800
5/5/2002	949,700	6/5/2002	1,556,300
5/6/2002	919,400	6/6/2002	1,205,800
5/7/2002	988,700	6/7/2002	1,043,600
5/8/2002	949,000	6/8/2002	1,050,600
5/9/2002	973,400	6/9/2002	1,012,400
5/10/2002	1,013,800	6/10/2002	1,025,500
5/11/2002	973,000	6/11/2002	1,530,500
5/12/2002	976,300	6/12/2002	1,401,900
5/13/2002	931,900	6/13/2002	1,301,700
5/14/2002	993.500	6/14/2002	1,505,300
5/15/2002	982,600	6/15/2002	1,572,500
5/16/2002	938,400	6/16/2002	1,559,000
5/17/2002	992,100	6/17/2002	1,486,200
5/18/2002	982,200	6/18/2002	878,250[b]
5/19/2002	976,800	6/19/2002	700,544[b]
5/20/2002	973,000	6/20/2002	735,528[b]
5/21/2002	1,030,400	6/21/2002	932,142[b]
5/22/2002	1,000,100	6/22/2002	1,352,000

Table C-1. (continued).

Date	Effluent (WW-013001) CPP-797 (gpd[a])	Date	Effluent (WW-013001) CPP-797 (gpd[a])
6/23/2002	1,194,000	7/24/2002	1,417,500
6/24/2002	825,700’	7/25/2002	1,448,700
6/25/2002	742,100[b]	7/26/2002	1,442,900
6/26/2002	893,300	7/27/2002	1,470,000
6/27/2002	729,400[b]	7/28/2002	1,407,200
6/28/2002	1,416,400	7/29/2002	1,431,600
6/29/2002	1,277,300	7/30/2002	1,340,300
6/30/2002	1,717,800	7/31/2002	1,276,000
7/1/2002	851,100	8/1/2002	1,511,800
7/2/2002	809,395[b]	8/2/2002	1,800,300
7/3/2002	1,494,700	8/3/2002	1,838,200
7/4/2002	1,442,900	8/4/2002	1,850,000
7/5/2002	1,439,300	8/5/2002	1,842,100
7/6/2002	1,475,600	8/6/2002	,752,600
7/7/2002	1,444,600	8/7/2002	,525,100
7/8/2002	1,450,700	8/8/2002	,298,100
7/9/2002	1,580,100	8/9/2002	,345,100
7/10/2002	1,589,000	8/10/2002	,350,800
7/11/2002	,491,800	8/11/2002	1,321,300
7/12/2002	,531,400	8/12/2002	1,289,600
7/13/2002	,560,800	8/13/2002	1,314,900
7/14/2002	,555,200	8/14/2002	1,299,200
7/15/2002	,563,200	8/15/2002	1,286,400
7/16/2002	,565,000	8/16/2002	1,332,300
7/17/2002	,335,430[b]	8/17/2002	1,309,900
7/18/2002	,477,900	8/18/2002	1,357,300
7/19/2002	,442,500	8/19/2002	1,304,600
7/20/2002	1,453,600	8/20/2002	1,317,700
7/21/2002	1,454,000	8/21/2002	1,325,000
7/22/2002	1,444,300	8/22/2002	1,303,000
7/23/2002	1,422,600	8/23/2002	1,303,000

Table C-1. (continued).

Date	Effluent (WW-013001) CPP-797 (gpd[a])	Date	Effluent (WW-013001) CPP-797 (gpd[a])
8/24/2002	1,307,100	*8/26/2002*	686,600[c]
8/25/2002	1,316,400		

Ponds.

The following tables represent hardcopies of the electronic Wastewater Land Application Permit (WLAP) data files. The following tables were first complied as worksheets within the WLAP Data Entry for LA-130-2.xls file using Microsoft Excel 97. The individual worksheets were saved as text files and incorporated as tables in this appendix. Other than formatting to fit the page and tabulating the data columns, no other formatting was performed. Columns for those parameters not required by the permit are not included in the tables, nor are rejected results shown in these data tables.

Hydraulic Worksheet from Wastewater Land Application Permit Data Entry for LA-130-2.XLS.

LAND APPLICATION OF WASTEWATER PROGRAM
ANNUAL REPORT FORMS — For Reporting Year -> 2001-2oM
WLAP Permit No.--> LA-000130-02
Software and Version no.:-----> MS Excel 97 SR-2

HYDRAULIC APPLICATION RATE

				Suppl
	Month	Manage-	WW	Irrig W
Permit	(use 15th	ment	Applied	Applied
No.	as date)	Unit	(MG)	(MG)
permitno	month	mangunit	wwapp	irrwapp
LA-000130	11/15/2001	MU-013001	42.30	
LA-000130	12/15/2001	MU-013001	48.82	
LA-000130	1/15/2002	MU-013001	49.46	
LA-000130	2/15/2002	MU-013001	38.05	
LA-000130	3/15/2002	MU-013001	41.45	
LA-000130	4/15/2002	MU-013001	34.39	
LA-000130	5/15/2002	MU-013001	31.28	
LA-000130	6/15/2002	MU-013001	35.54	
LA-000130	7/15/2002	MU-013001	44.11	
LA-000130	8/15/2002	MU-013001	36.49	

Note:
1. Dates here denote each month of the year.
2. These dates by convention shall be the 15th of the month.
3. Each twelve month cycle is repeated for each management unit.
4. If the management unit was not used for land application, enter all zeros.
5. For monthly date, use date function.
6. Do not change any protected cell.
3. Make sure units for data entered are consistent with units specified in column headings.

Service Waste Flowrate to New Perc Ponds for CY2002

Service Waste Flow (x1000 gal)	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03
1	1,550.6	1,537.0	1,401.7	1,406.1	1,308.8	1,431.1						
2	1,574.9	1,515.0	1,420.1	1,384.2	1,296.0	1,475.1						
3	1,530.9	1,607.1	1,451.9	1,409.2	1,294.8	1,469.4						
4	1,531.0	1,551.1	1,419.4	1,390.1	1,306.0	1,471.3						
5	1,525.4	1,550.5	1,436.0	1,367.6	1,293.7	1,434.3						
6	1,605.6	1,556.9	1,428.0	1,352.4	1,293.1	1,435.2						
7	1,583.6	1,602.5	1,447.7	1,407.9	1,227.7	1,424.6						
8	1,564.6	1,611.4	1,444.3	1,364.2	1,188.7	1,292.0						
9	1,662.4	1,602.1	1,435.2	1,463.9	1,017.2	1,292.8						
10	1,570.4	1,578.8	1,403.8	1,485.0	1,206.4	1,413.0						
11	1,634.3	1,626.2	1,434.3	1,443.4	1,358.3	1,477.7						
12	1,576.3	1,588.4	1,397.3	1,444.6	1,155.0	1,489.3						
13	1,566.8	1,604.3	1,432.5	1,475.4	1,111.1	1,456.5						
14	1,568.7	1,626.0	1,404.5	1,436.0	1,112.8	1,413.1						
15	1,558.5	1,532.6	1,408.3	1,410.2	1,209.0	1,314.9						
16	1,544.8	1,526.6	1,442.7	1,362.2	1,305.8	1,240.9						
17	1,559.9	1,552.1	1,405.1	1,415.4	1,261.2	1,283.3						
18	1,569.1	1,525.4	1,389.1	1,397.3	1,257.6	1,469.0						
19	1,562.8	1,531.3	1,426.8	1,378.6	1,254.4							
20	1,545.2	1,539.0	1,394.8	1,387.5	1,258.6							
21	1,532.5	1,469.0	1,405.1	1,382.5	1,192.0							
22	1,543.8	1,428.3	1,416.1	1,386.1	1,281.3							
23	1,544.6	1,422.0	1,394.6	1,411.1	1,314.2							
24	1,519.3	1,405.8	1,419.2	1,396.3	1,348.0							
25	1,532.8	1,522.5	1,384.9	1,373.5	1,442.3							
26	1,558.3	1,429.2	1,398.6	1,341.8	1,392.0							
27	1,536.8	1,400.2	1,404.3	1,346.3	1,327.3							
28	1,557.7	1,420.1	1,376.7	1,340.9	1,281.5							
29	1,526.0		1,381.3	[redacted]	1,388.7							
30	1,545.0		1,382.8	[redacted]	1,439.0							
31	1,525.5		1,400.6		1,505.4							

	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03
Month Tot (x1000 gal)	48,308	42,861	43,788	40,835	39,628	25,284						
Daily Ave (x1000 gal)	1,558	1,531	1,413	1,361	1,278	1,405						
Daily Max (x1000 gal)	1,662	1,626	1,452	1,485	1,505	1,489						
Daily Min (x1000 gal)	1,519	1,400	1,377	763	1,017	1,241						

	CY 2003
Year Total (x1000 gal)	240,704
Daily Ave (x1000 gal)	1,424
Daily Max (x1000 gal)	1,662
Daily Min (x1000 gal)	763

There were 2 days during 2003 with flows less then 1.00 MG (<33% daily limit based on 3 MGD)
There were 0 days during 2003 with flows greater then 2.00 MG (>67% daily limit based on 3 MGD)
There were 0 days during 2003 with flows greater then 3.00 MG (exceeded daily limit of 3 MGD)

Service Waste Flowrate to New Perc Ponds for CY2002

Service Waste Flow (x1000 gal)	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	##	##	##	##	##	##
1	1,550.6	1,537.0	1,401.7	1,406.1	1,308.8	1,431.1						
2	1,574.9	1,515.0	1,420.1	1,384.2	1,296.0	1,475.1						
3	1,530.9	1,607.1	1,451.9	1,409.2	1,294.8	1,469.4						
4	1,531.0	1,551.1	1,419.4	1,390.1	1,306.0	1,471.3						
5	1,525.4	1,550.5	1,436.0	1,367.6	1,293.7	1,434.3						
6	1,605.6	1,556.9	1,428.0	1,352.4	1,293.1	1,435.2						
7	1,583.6	1,602.5	1,447.7	1,407.9	1,227.7	1,424.6						
8	1,564.6	1,611.4	1,444.3	1,364.2	1,188.7	1,292.0						
9	1,662.4	1,602.1	1,435.2	1,463.9	1,017.2	1,292.8						
10	1,570.4	1,578.8	1,403.8	1,485.0	1,206.4	1,413.0						
11	1,634.3	1,626.2	1,434.3	1,443.4	1,358.3	1,477.7						
12	1,576.3	1,588.4	1,397.3	1,444.6	1,155.0	1,489.3						
13	1,566.8	1,604.3	1,432.5	1,475.4	1,111.1	1,456.5						
14	1,568.7	1,626.0	1,404.5	1,436.0	1,112.8	1,413.1						
15	1,558.5	1,532.6	1,408.3	1,410.2	1,209.0	1,314.9						
16	1,544.8	1,526.6	1,442.7	1,362.2	1,305.8	1,240.9						
17	1,559.9	1,552.1	1,405.1	1,415.4	1,261.2	1,283.3						
18	1,569.1	1,525.4	1,389.1	1,397.3	1,257.6	1,469.0						
19	1,562.8	1,531.3	1,426.8	1,378.6	1,254.4							
20	1,545.2	1,539.0	1,394.8	1,387.5	1,258.6							
21	1,532.5	1,469.0	1,405.1	1,382.5	1,192.0							
22	1,543.8	1,428.3	1,416.1	1,386.1	1,281.3							
23	1,544.6	1,422.0	1,394.6	1,411.1	1,314.2							
24	1,519.3	1,405.8	1,419.2	1,396.3	1,348.0							
25	1,532.8	1,522.5	1,384.9	1,373.5	1,442.3							
26	1,558.3	1,429.2	1,398.6	1,341.8	1,392.0							
27	1,536.8	1,400.2	1,404.3	1,346.3	1,327.3							
28	1,557.7	1,420.1	1,376.7	1,340.9	1,281.5							
29	1,526.0		1,381.3	[redacted]	1,388.7							
30	1,545.0		1,382.8	[redacted]	1,439.0							
31	1,525.5		1,400.6		1,505.4							

	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	##	##	##	##	##	##
Month Tot (x1000 gal)	48,308.100	42,861.400	43,787.700	40,835.300	39,627.900	25,283.500						
Daily Ave (x1000 gal)	1,558	1,531	1,413	1,361	1,278	1,405						
Daily Max (x1000 gal)	1,662	1,626	1,452	1,485	1,505	1,489						
Daily Min (x1000 gal)	1,519	1,400	1,377	763	1,017	1,241						

	CY 2003
Year Total (x1000 gal)	240,704
Daily Ave (x1000 gal)	1,424
Daily Max (x1000 gal)	1,662
Daily Min (x1000 gal)	763

There were 2 days during 2003 with flows less then 1.00 MG (<33% daily limit based on 3 MGD)
There were 0 days during 2003 with flows greater then 2.00 MG (>67% daily limit based on 3 MGD
There were 0 days during 2003 with flows greater then 3.00 MG (exceeded daily limit of 3 MGD)

Service Waste Flow (x1000 gal)	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03
1	1,550.6	1,537.0	1,401.7	1,406.1	1,308.8	1,431.1	1,503.5	1,280.5	
2	1,574.9	1,515.0	1,420.1	1,384.2	1,296.0	1,475.1	1,519.8	1,273.1	
3	1,530.9	1,607.1	1,451.9	1,409.2	1,294.8	1,469.4	1,536.4	1,218.7	
4	1,531.0	1,551.1	1,419.4	1,390.1	1,306.0	1,471.3	1,553.5	1,180.5	
5	1,525.4	1,550.5	1,436.0	1,367.6	1,293.7	1,434.3	1,530.1	1,187.8	
6	1,605.6	1,556.9	1,428.0	1,352.4	1,293.1	1,435.2	1,562.4	1,025.9	
7	1,583.6	1,602.5	1,447.7	1,407.9	1,227.7	1,424.6	1,440.5	1,038.1	
8	1,564.6	1,611.4	1,444.3	1,364.2	1,188.7	1,292.0	1,406.6	1,060.8	
9	1,662.4	1,602.1	1,435.2	1,463.9	1,017.2	1,292.8	1,305.1	1,053.7	
10	1,570.4	1,578.8	1,403.8	1,485.0	1,206.4	1,413.0	1,333.2	1,040.0	
11	1,634.3	1,626.2	1,434.3	1,443.4	1,358.3	1,477.7	1,324.8	1,024.3	
12	1,576.3	1,588.4	1,397.3	1,444.6	1,155.0	1,489.3	1,495.4	1,040.6	
13	1,566.8	1,604.3	1,432.5	1,475.4	1,111.1	1,456.5	1,510.6	1,249.9	
14	1,568.7	1,626.0	1,404.5	1,436.0	1,112.8	1,413.1	1,506.4		
15	1,558.5	1,532.6	1,408.3	1,410.2	1,209.0	1,314.9	1,485.6		
16	1,544.8	1,526.6	1,442.7	1,362.2	1,305.8	1,240.9	1,449.0		
17	1,559.9	1,552.1	1,405.1	1,415.4	1,261.2	1,283.3	1,524.7		
18	1,569.1	1,525.4	1,389.1	1,397.3	1,257.6	1,469.0	1,457.3		
19	1,562.8	1,531.3	1,426.8	1,378.6	1,254.4	1,451.6	1,454.1		
20	1,545.2	1,539.0	1,394.8	1,387.5	1,258.6	1,492.1	1,471.9		
21	1,532.5	1,469.0	1,405.1	1,382.5	1,192.0	1,527.3	1,470.3		
22	1,543.8	1,428.3	1,416.1	1,386.1	1,281.3	1,488.0	1,534.4		
23	1,544.6	1,422.0	1,394.6	1,411.1	1,314.2	1,431.3	1,490.4		
24	1,519.3	1,405.8	1,419.2	1,396.3	1,348.0	1,441.6	1,507.1		
25	1,532.8	1,522.5	1,384.9	1,373.5	1,442.3	1,430.0	1,401.2		
26	1,558.3	1,429.2	1,398.6	1,341.8	1,392.0	1,367.0	1,316.1		
27	1,536.8	1,400.2	1,404.3	1,346.3	1,327.3	1,352.4	1,323.4		
28	1,557.7	1,420.1	1,376.7	1,340.9	1,281.5	1,508.8	1,373.9		
29	1,526.0		1,381.3	763.2	1,388.7	1,552.4	1,335.9		
30	1,545.0		1,382.8	912.4	1,439.0	1,538.8	1,287.2		
31	1,525.5		1,400.6		1,505.4		1,308.4		

	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03
Month Tot (x1000 gal)	48.308	42.861	43.788	40.835	39.628	42,865	44,719	14,674	
Daily Ave (x1000 gal)	1,558	1,531	1,413	1,361	1,278	1,429	1,443	1,129	

Service Waste Flowrate to New Perc Ponds for *CY2002*

	CY 2003
Year Total (x1000 gal)	317,678
Daily Ave (x1000 gal)	1,412
Daily Max (x1000 gal)	1,662

There were 2 days during 2003 with flows less then 1.00 MG (<33% daily limit based on 3 M
There were 0 days during 2003 with flows greater then 2.00 MG (>67% daily limit based on
There were 0 days during 2003 with flows greater then 3.00 MG (exceeded daily limit of 3 M

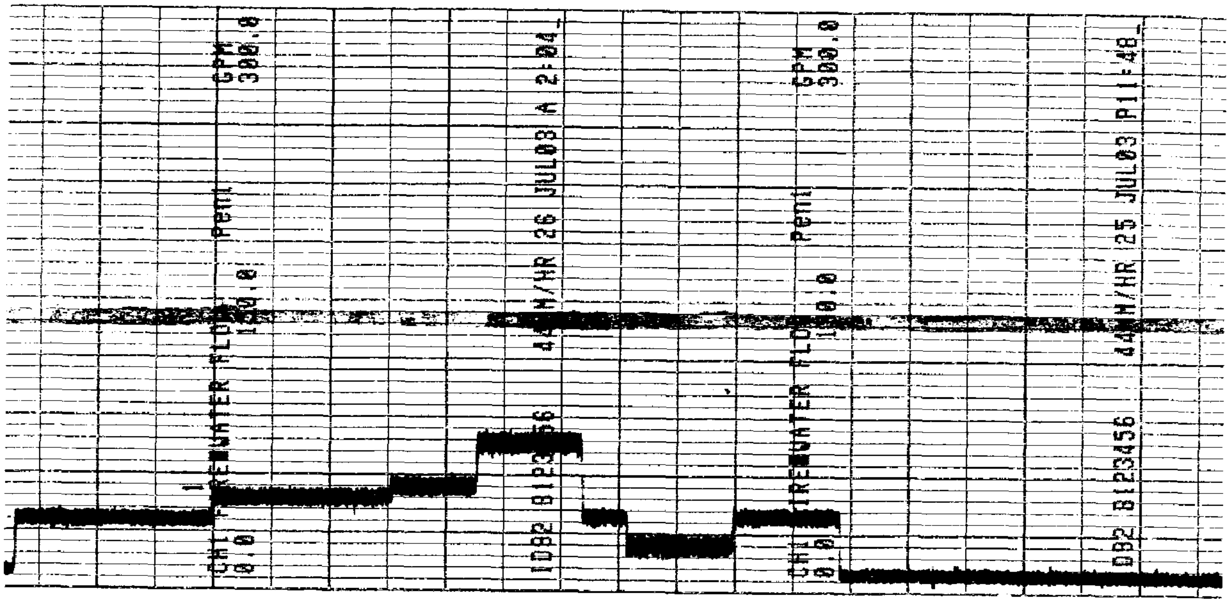
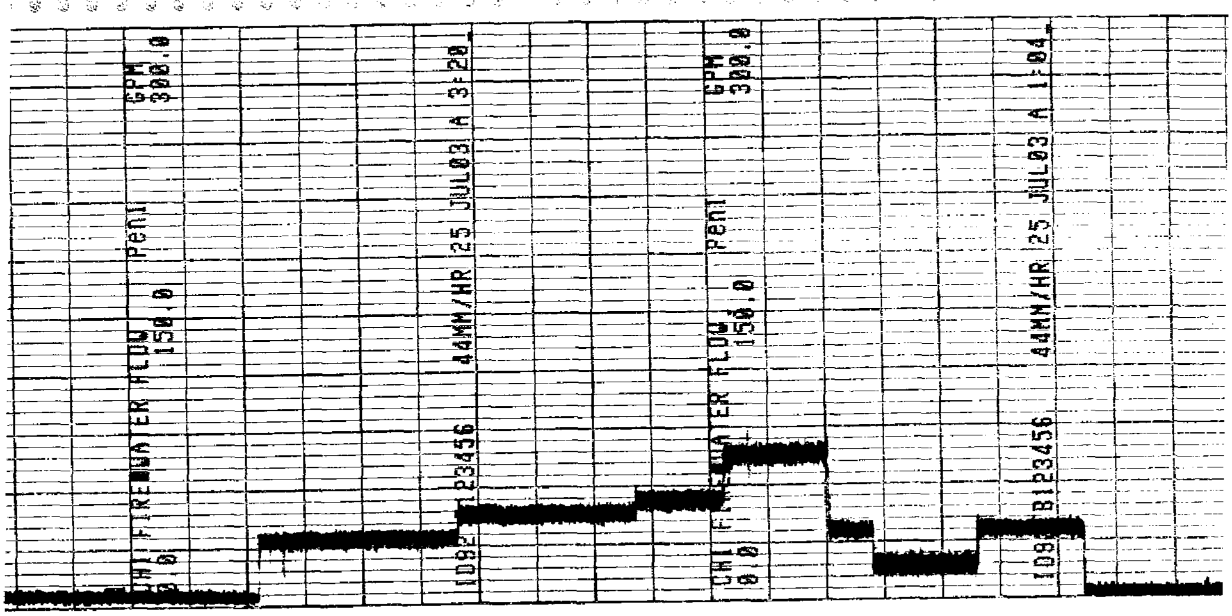
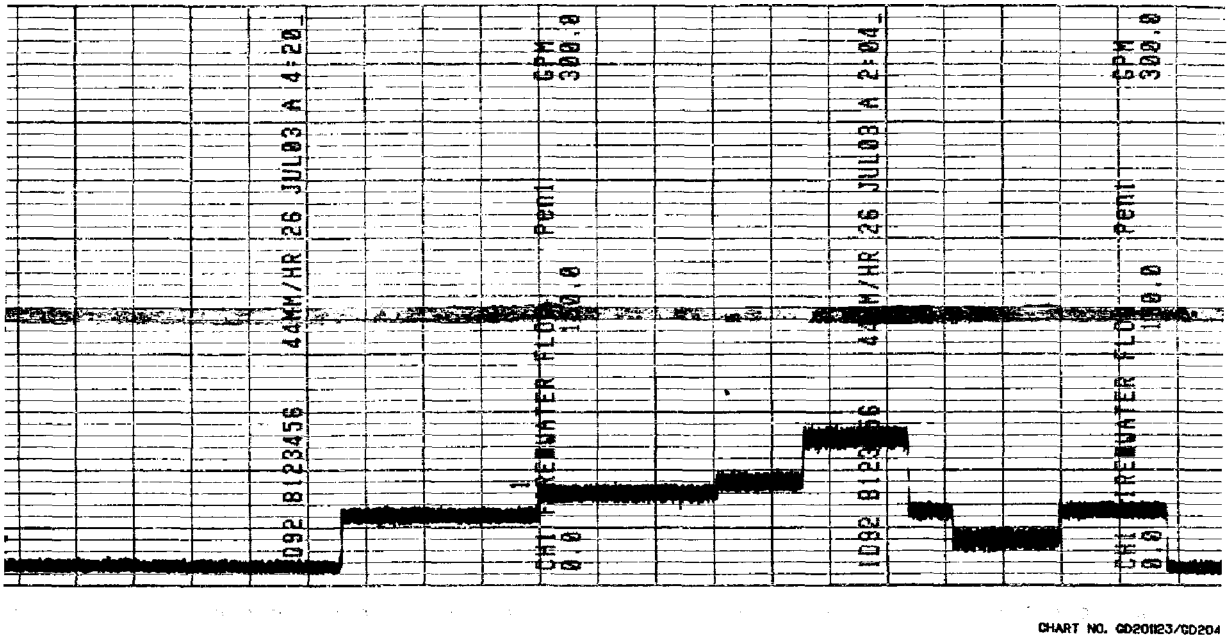


CHART NO. 00201123/00204080U050

FIRE WATER JOCKEY PUMP OUTLET FLOW METER
(SPRINKLING CURVE)




44MM/HR 26 JUL03 A 4:20
FIREWATER FLOW
Pen1
GPM
300.0
CHART NO. GD20123/GD204

Appendix D

Maps of the Distribution and Collections Systems for INTEC

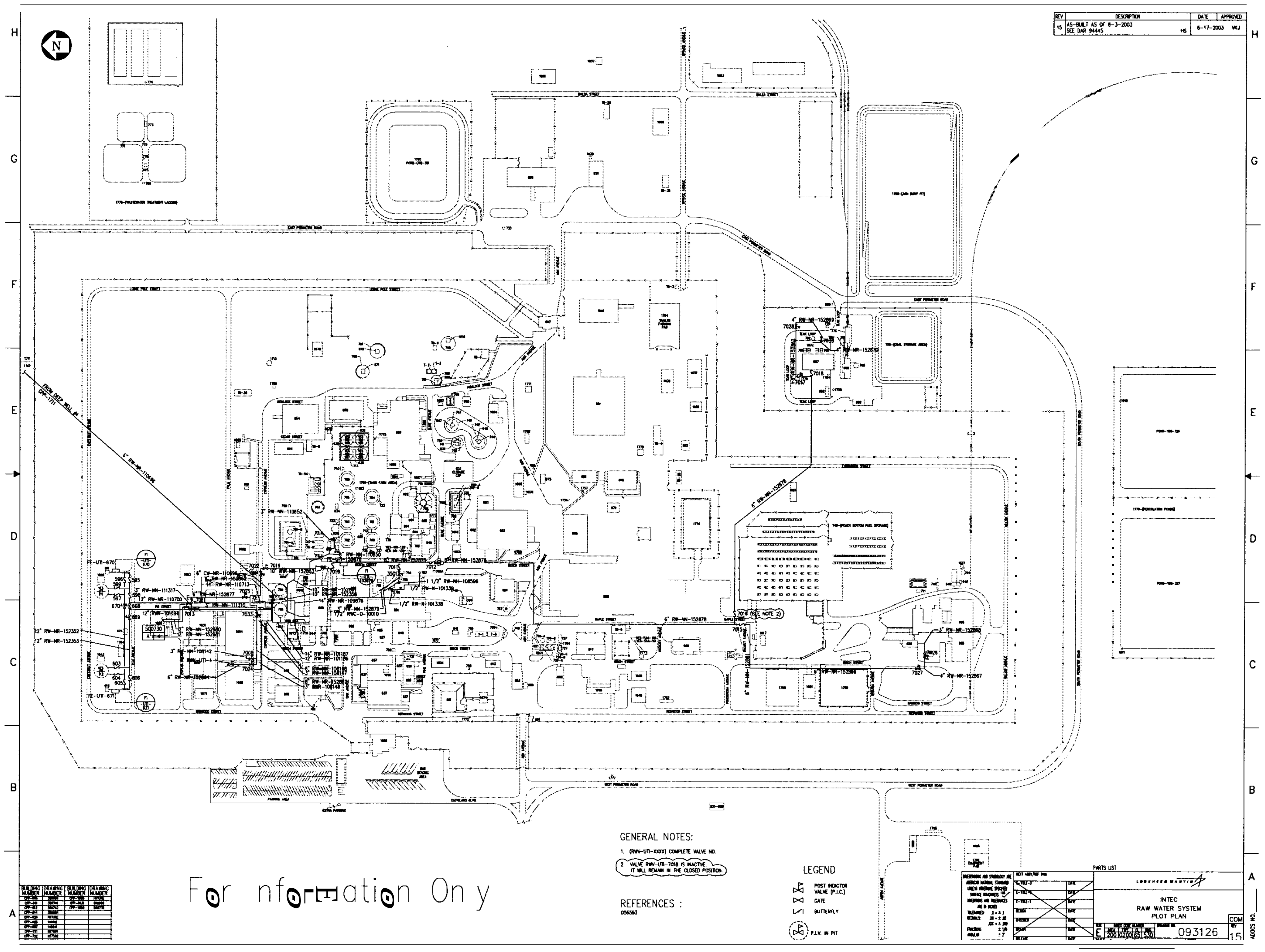


Figure D-1. Plot plan for the Idaho Nuclear Technology Engineering Center (INTEC) raw water system.

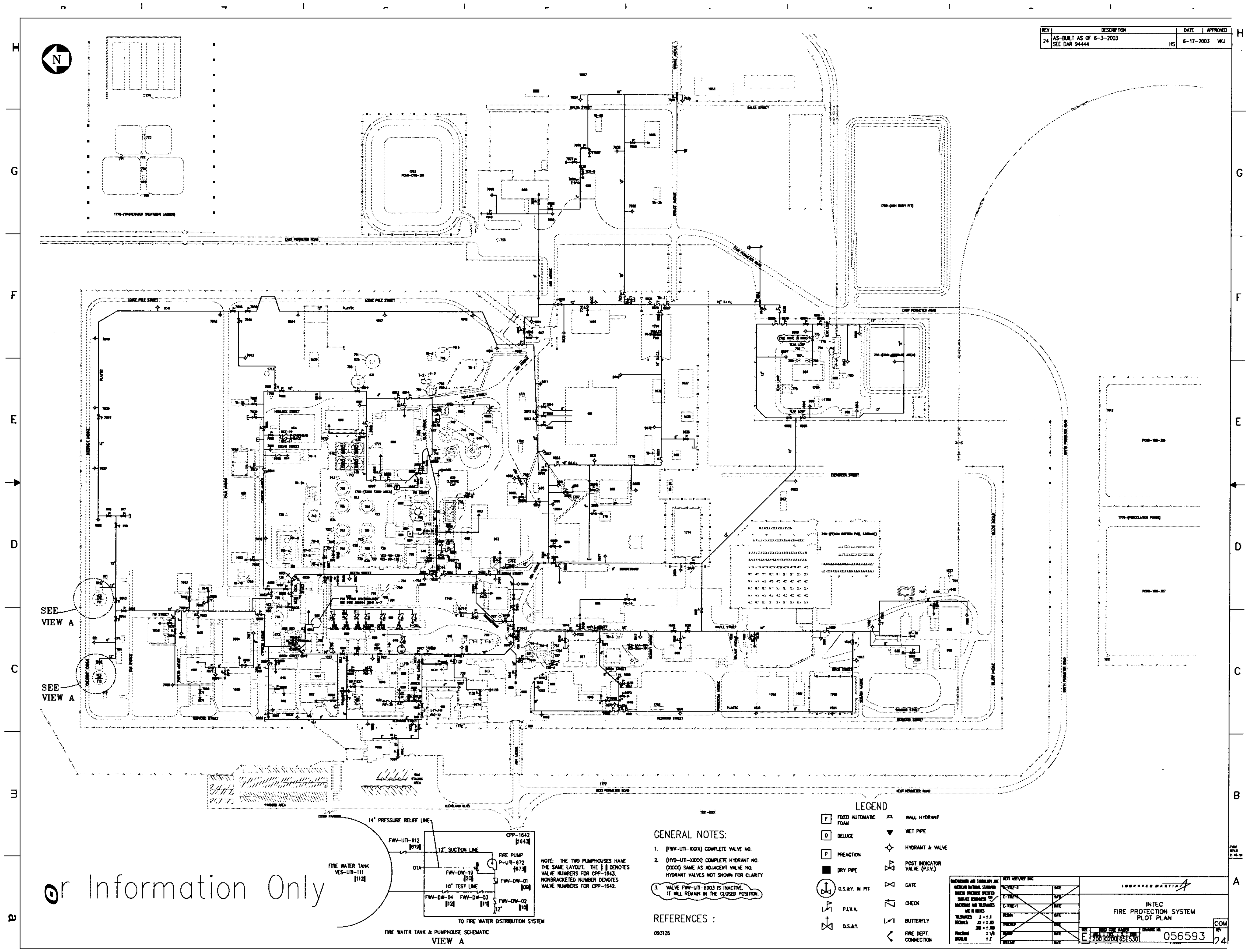


Figure D-2. Plot plan for the Idaho Nuclear Technology Engineering Center (INTEC) fire protection system.

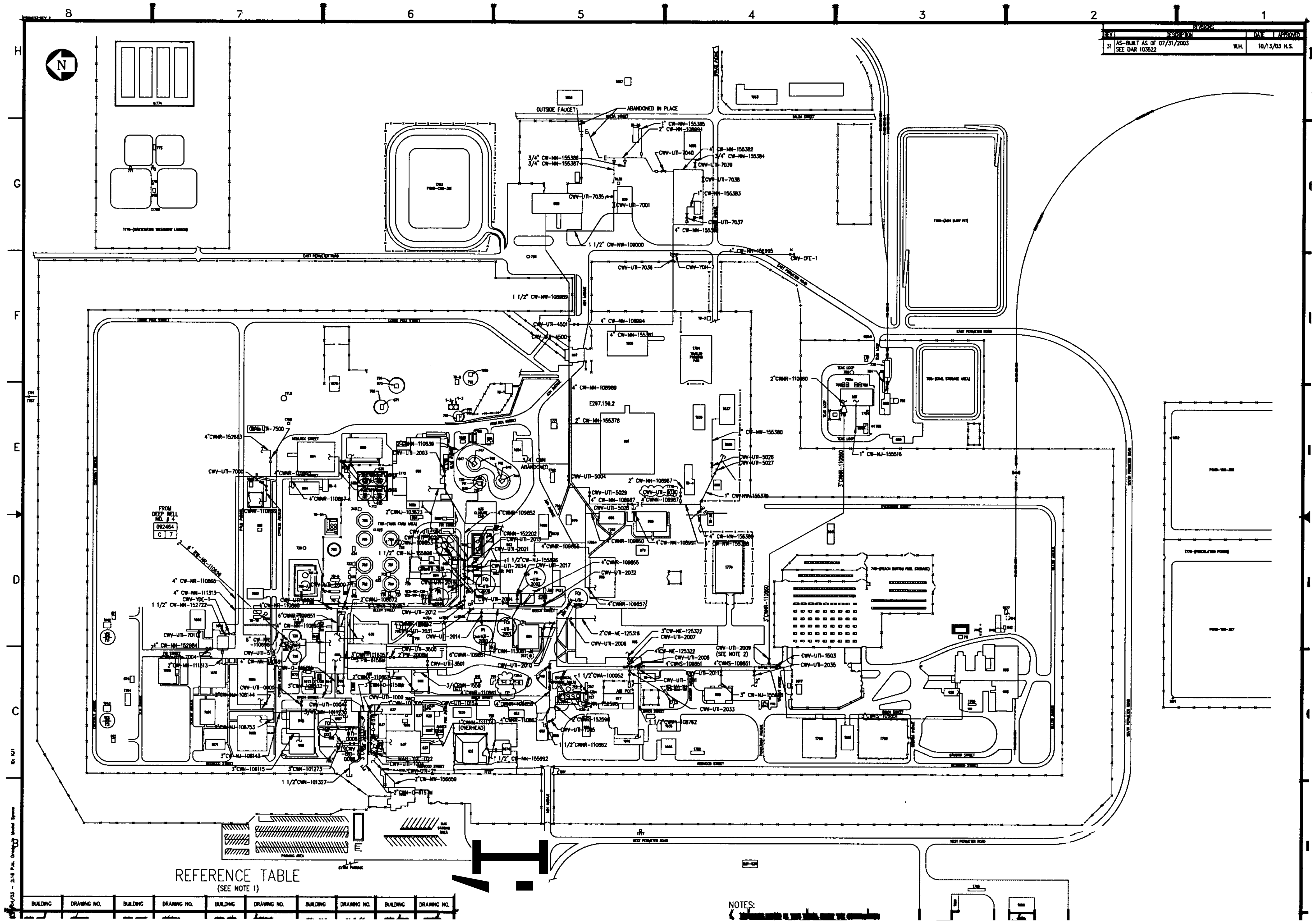


Figure D-3. Flowsheet for the Idaho Nuclear Technology and Engineering Center (INTEC) utility one-line potable water.

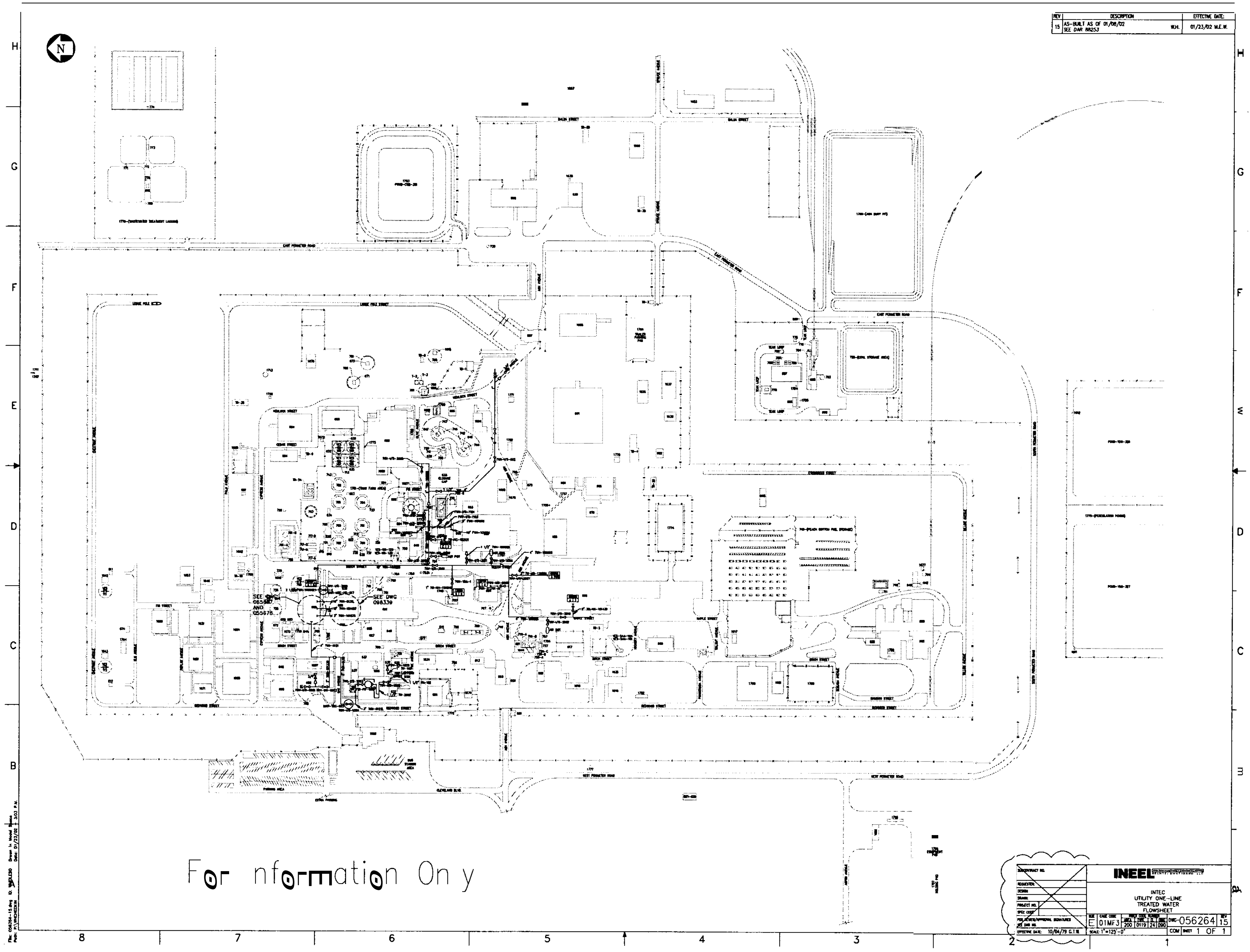


Figure D-4. Flowsheet for the Idaho Nuclear Technology and Engineering Center (INTEC) utility one-line treated water.

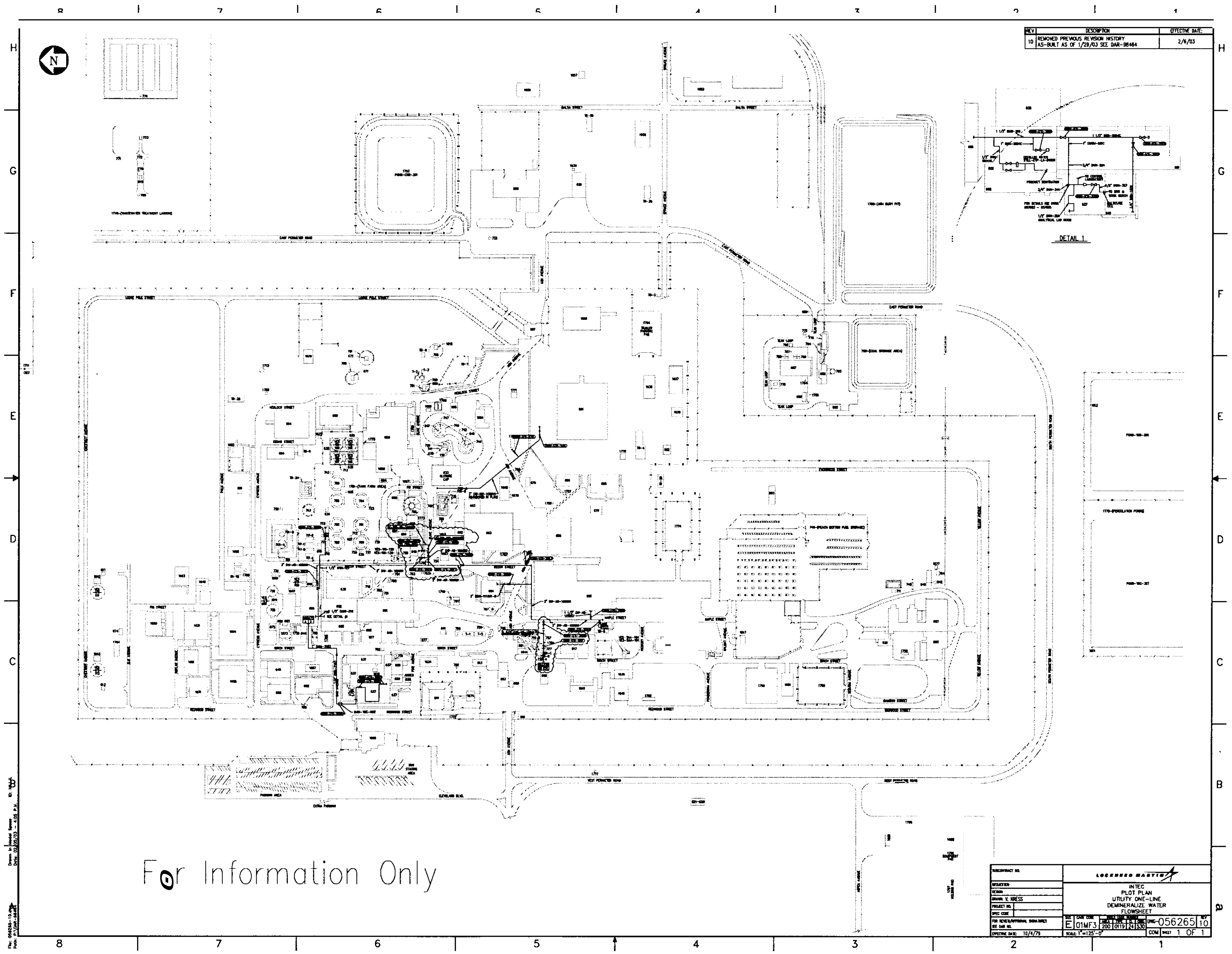


Figure D-5. Flowsheet for the Idaho Nuclear Technology and Engineering Center (INTEC) plot plan utility one-line demineralized water.

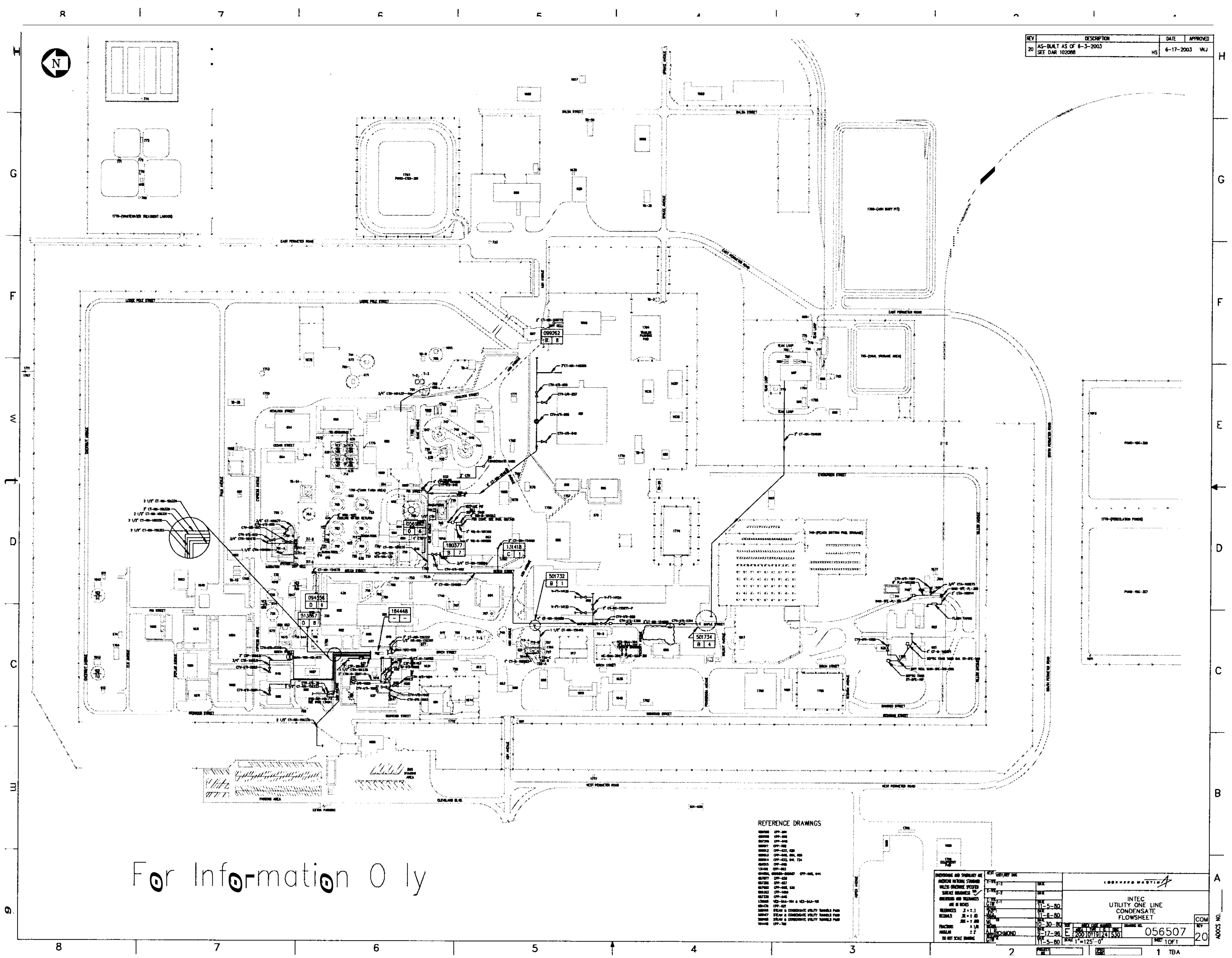


Figure D-6. Flowsheet for the Idaho Nuclear Technology and Engineering Center (INTEC) utility one-line steam condensate.

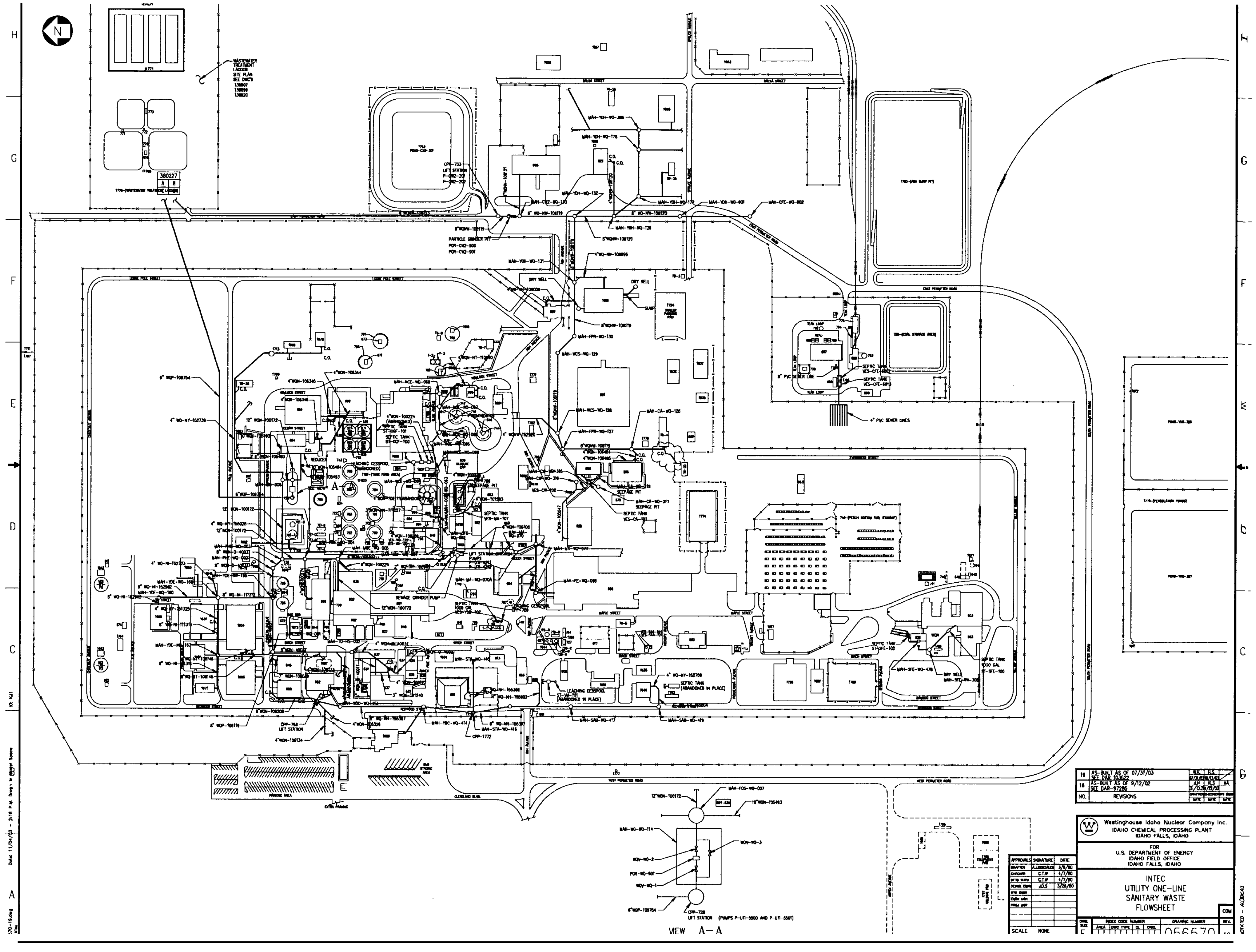


Figure D-7. Flowsheet for the Idaho Nuclear Technology and Engineering Center (INTEC) utility one-line sanitary waste.

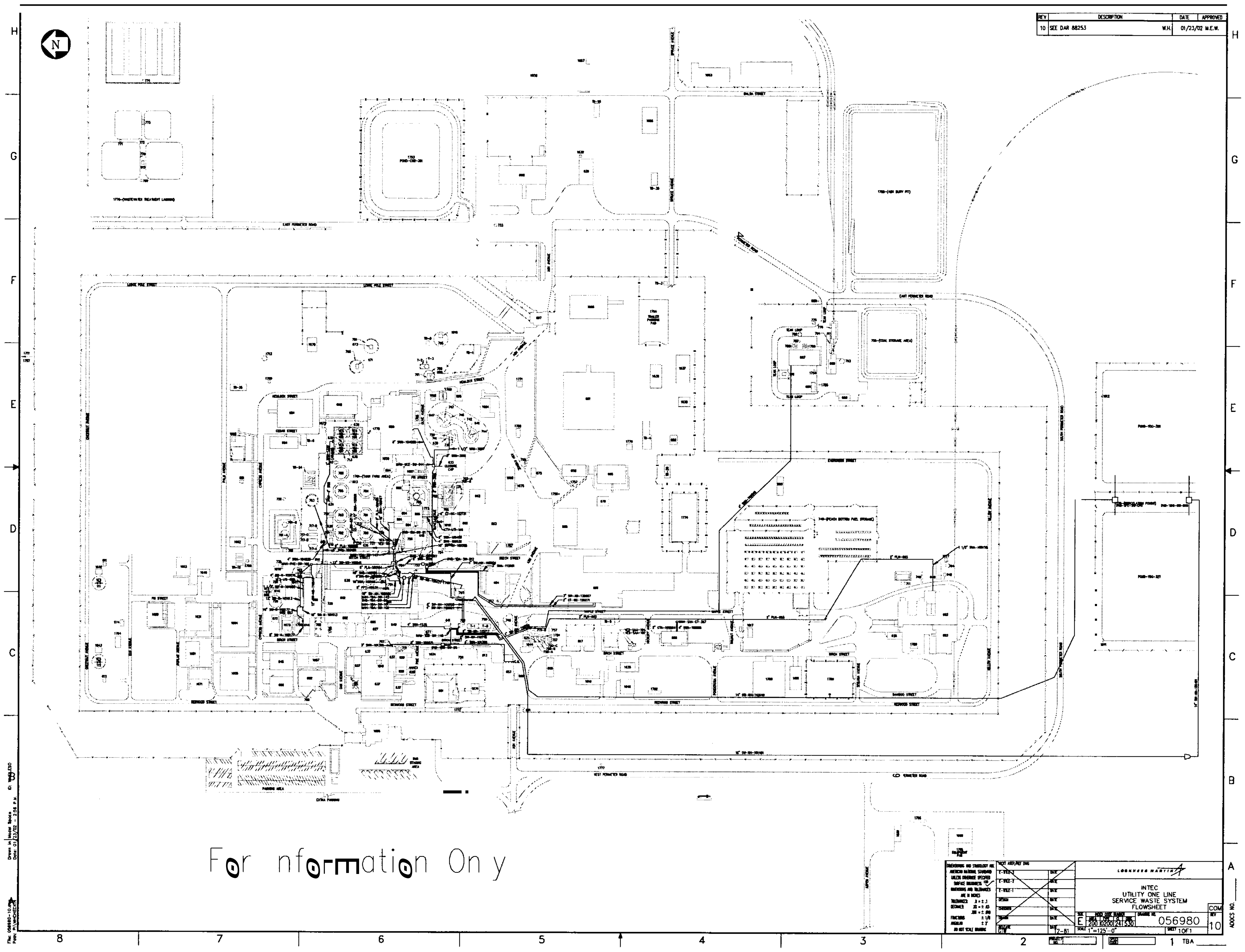


Figure D-8. Flowsheet for the Idaho Nuclear Technology and Engineering Center (INTEC) utility one-line service waste system.